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# COMMERCIAL FISHERIES REVIEW

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ALBERT M. DAY, Director

# COMMERCIAL FISHERIES REVIEW

A REVIEW OF DEVELOPMENTS AND NEWS OF THE FISHERY INDUSTRIES
PREPARED IN THE BRANCH OF COMMERCIAL FISHERIES

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# COMMERCIAL FISHERIES REVIEW

October 1948 Washington 25, D.C. Vol.10, No.10

## CURRENT HADDOCK SITUATION ON GEORGE'S BANK[1/]

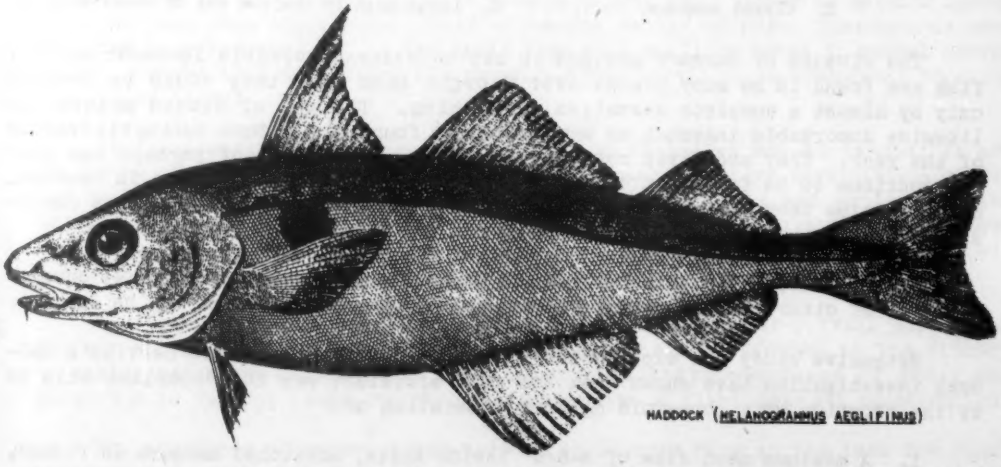
By Howard A. Schuck*

The haddock fishery is New England's most valuable fishery resource, but the production of haddock in recent years has declined considerably, from a high of 260,000,000 pounds in 1929 to averages of less than 150,000,000 pounds in the past few years.

The primary object of the Haddock Investigation of the Fish and Wildlife Service has been to determine what factors have caused this decline and to determine what measures, if any, would serve to restore production to the highest possible sustained level. Such an investigation has necessitated an understanding of the factors concerning birth and death rates, age and growth, migrations, spawning habits, the extent of the commercial catch, the size of the population, and other important factors. At the present time, these studies are being summarized for the Georges Bank area, the most important haddock area insofar as United States fishermen are concerned.

The catch on Georges Bank has declined in a large measure, owing to an actual decline in the size of the stock on the bank. At present, there are only one-quarter to one-third as many haddock on the bank as in earlier years.

The increased use of small-meshed trawls and the decreased use of line trawls has been a prominent feature in this decline. Line trawls which originally accounted for the bulk of the haddock catch caught only good-sized fish, most of which were mature.



HADDOCK (MELANOGRAMMUS AEGLEFINUS)

*Aquatic Biologist, New England Fishing Banks Investigations, U.S. Fish and Wildlife Service, Woods Hole, Mass.

1/ A paper presented at the North Atlantic Section Meeting of the Atlantic States Marine Fisheries Commission in New York City on February 20, 1948.

With the use of small-meshed otter trawls, which at present account for over 90 percent of all haddock caught, haddock as young as one year old are brought up to the deck and sluiced or dumped overboard dead. Millions of these fish less than a pound in weight are caught and discarded, a total loss. If these fish of one year of age were not caught until they were three years of age, they would each weigh about ten times as much. The foolishness of destroying such small fish thus appears quite evident. From what investment can one get such a high rate of interest?

The extent of this loss is illustrated by the following figures. Beginning with a stock of 70,000,000 one-year-old haddock on Georges Bank (a reasonable number), we estimate that about 63,000,000 would be left on the bank at the end of their second year of life, and 56,700,000 at the end of their third year of life, if not destroyed by otter trawls (not more than 10 percent die from natural causes each year). The weight of these fish when they were only one year old would be in the neighborhood of a paltry 13,177,000 pounds, worth only about $414,000. The same fish at two years of age would weigh over 59,294,000 pounds, valued at $1,862,000, and the same fish at three years of age would reach the considerable total of 88,452,000 pounds, worth $6,484,000.

Another advantage in protecting haddock until an age of three years is reached is that a much greater number would be allowed to spawn at least once before being caught. Haddock on Georges Bank spawn for the first time at the age of three years.

The protection of baby scrod on Georges Bank, and possibly on the Nova Scotian Banks also, offers a method of considerably increasing the productivity of the New England haddock fishery. In these critical times, when food production is of national and worldwide importance, it is vital to prevent the destroying and wasting of such quantities of high-quality, protein food.

Several methods for protecting baby haddock have been considered, among them the following:

1. Closed nursery grounds.
2. Closed seasons.
3. A minimum market size.
4. Large mesh in the cod end of otter trawls.

The closure of nursery grounds is not considered workable inasmuch as baby fish are found in so many places over Georges Bank that they could be avoided only by almost a complete cessation of fishing. The use of closed seasons is likewise unworkable inasmuch as baby scrod are found on the Bank during all seasons of the year. They are first retained in cod ends at an age of perhaps one year and continue to be taken and discarded until an age of 2½ to 3 years is reached, at which time they are all of marketable size and are brought to port as small-sized scrod.

The destruction of potentially-valuable baby scrod is not an essential characteristic of otter trawls, however. The waste of these small haddock can be stopped.

Extensive study and experimentation by the Fish and Wildlife Service's Haddock Investigation have shown that the most efficient way to accomplish this is by the adoption of a threefold measure consisting of:

1. A minimum mesh size of 4-5/8" inside knots, stretched measure as fished, in all parts of the trawl with the exception of the lower belly, cod end belly, and 3' of the rear end of the cod end top, in which parts mesh as small as 3-1/4"

could be used in order to reduce tear-ups. No restrictions as to weight of twine, single or double, have been recommended.

In studying whether such large mesh actually would release baby haddock, a large number of experimental tows were made by the Fish and Wildlife Service with large and with standard mesh. All fish taken in each type cod end were counted and measured.

COD END (FISH BAG)

The results of this study were very definite. Only one-fifth as many baby scrod were taken in the large mesh as in the small-meshed cod ends. Therefore, four-fifths of those ordinarily taken were actually released by the use of the larger-meshed cod ends. Thus, although it is undoubtedly true that all meshes pull together somewhat, it is certain that the use of the larger mesh succeeds in releasing most baby scrod.

In addition, the tests proved that the large-meshed cod ends caught the same number of scrod (1⅛ to 2⅛ pounds) and an even greater number of large haddock than the small-meshed cod end. Further advantages of such cod ends over those now in use are:

(a) the decreased cost of the net;
(b) ease of handling due to relative absence of trash;
(c) ease of mending due to fewer knots; and
(d) increased towing speeds due to its lightness.

The necessary strength can be assured by the use of heavier twine.

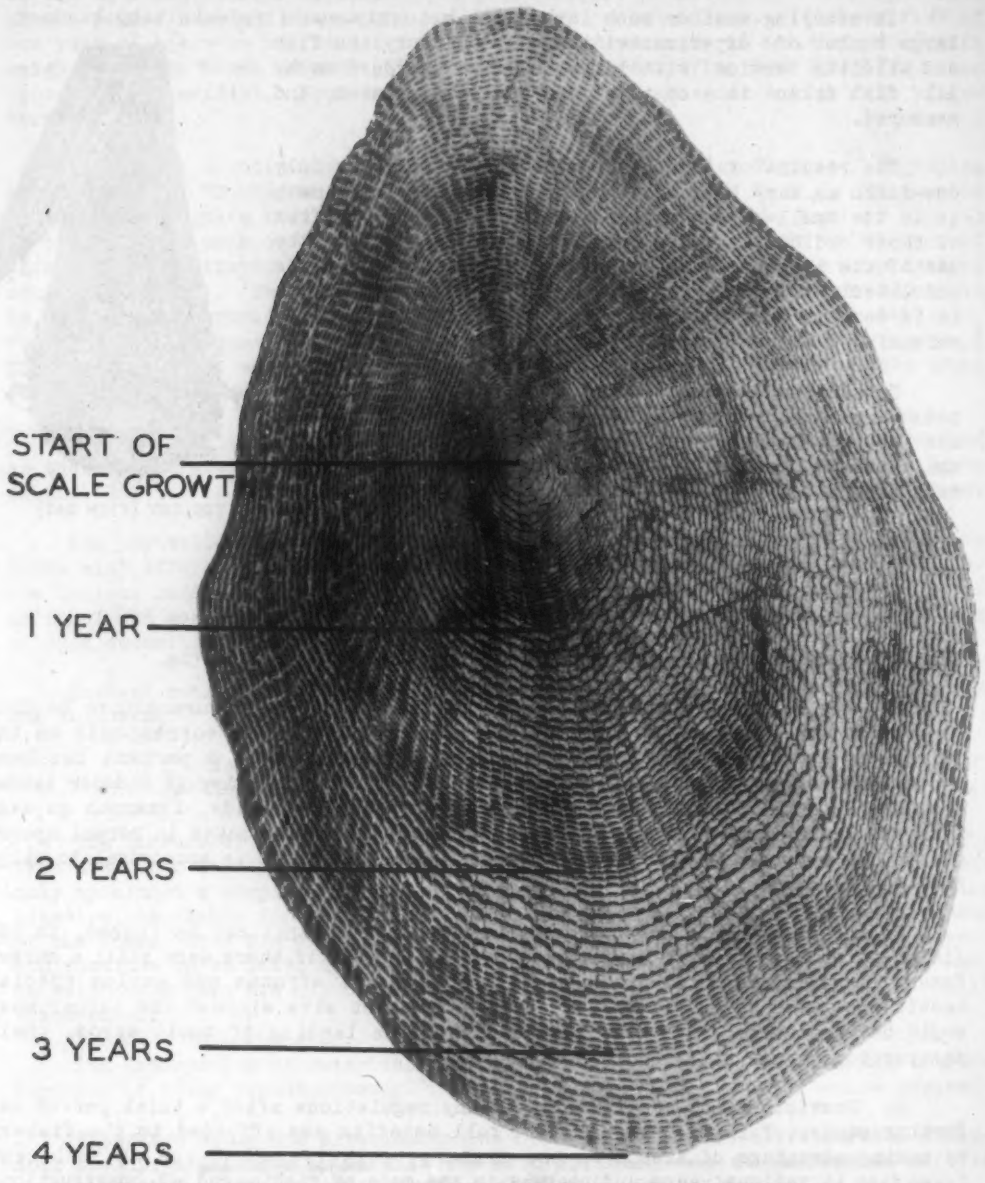
2. A minimum legal market size of 16½ inches, such measurement to be from the tip of the snout to the fork in the tail. This length corresponds on the average to about 1⅛ pounds, gutted weight. A tolerance of 5 percent has been recommended; in other words, up to 5 percent of the total number of haddock landed could be less than 16½ inches. This allowance should be made, inasmuch as even with the larger-meshed net, a few small fish will still be taken in normal operations. Rather than dump these fish back (a total loss), it is economical to allow them to be landed.

It is necessary to adopt a minimum size of fish that can be landed, in addition to the adoption of larger-meshed nets, because if there were still a market for small scrod, some fishermen would make special efforts and employ special tactics to catch them. Likewise, a minimum market size without the larger mesh would be inadequate, for while it would stop the landing of small scrod, their destruction at sea still would continue.

3. Provisions for modification of any regulations after a trial period and further study. This will insure that full benefits are afforded to the fishery by taking advantage of trends in the fishery, relative abundance of small and large fish in various years, and changes in the mode of fishing and net construction.

The abundance of market-sized haddock on Georges Bank in the last few years has declined to the lowest point in history. This condition has been the joint result of heavy annual removals of commercial-sized and undersized haddock by the

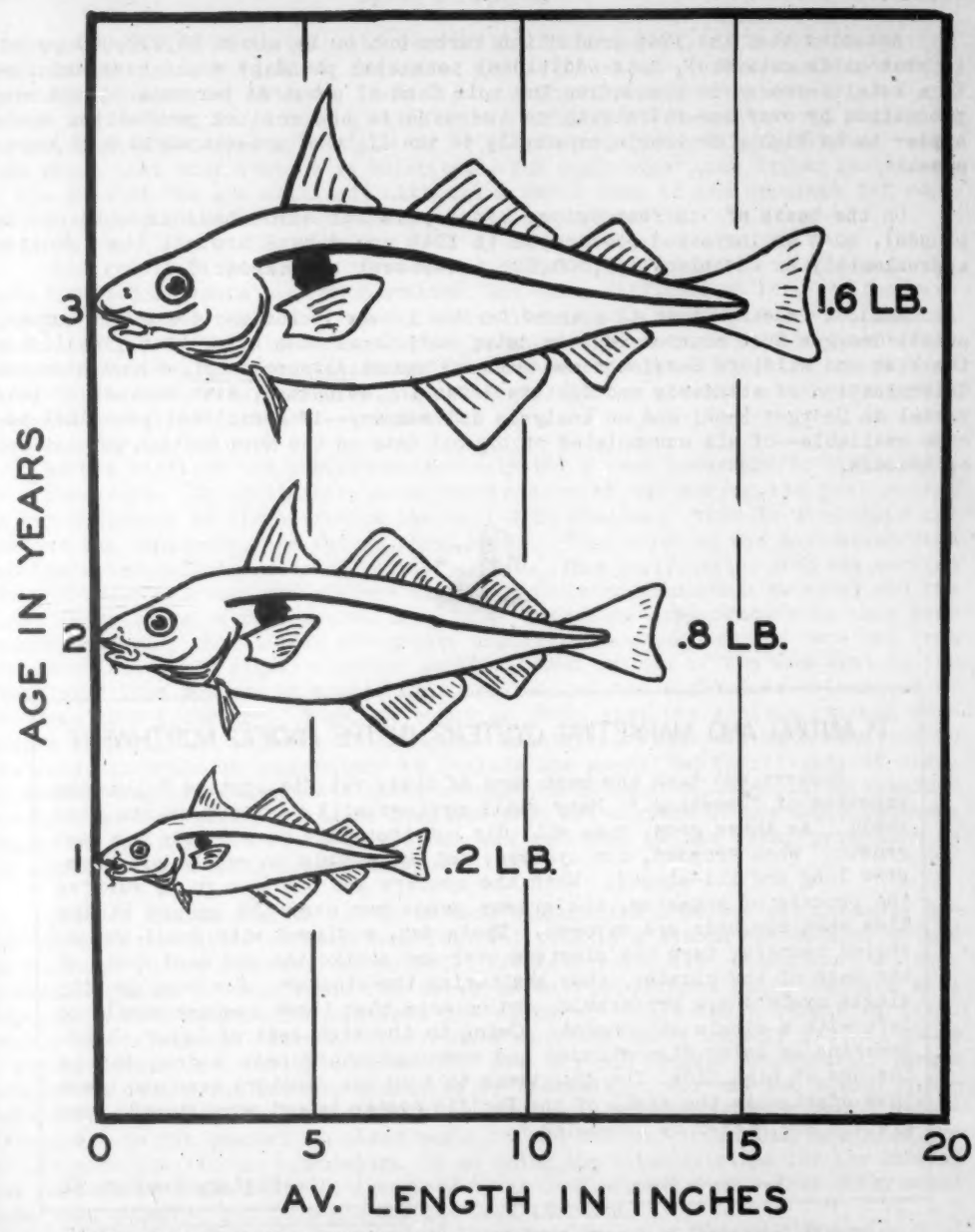
fishing fleet and extremely small additions to the commercial-sized stock from the spawnings of 1941, 1942, and 1943.




PHOTOGRAPH OF A HADDOCK SCALE. A FOUR YEAR OLD FISH FROM GEORGES BANK.

We are at present investigating the reasons why these succeeding spawnings proved to be relative failures. The appearance early in 1947 of large numbers of baby haddock on the Bank (most of the 1945 spawning) offered the possibility that if these fish would be allowed to reach commercial and spawning size, the

marketable stock could be rebuilt to somewhere near its former high level. These baby fish were destroyed, however, by small-meshed otter trawls and discarded by the millions on the Bank. During the complete year of 1947, almost 17,000,000 baby haddock, too small to market, were discarded dead on Georges Bank alone.




AVERAGE SIZE OF GEORGES BANK HADDOCK AT END OF 1, 2, AND 3 YEARS OF LIFE.

From our knowledge of the mortality and growth rates for Georges Bank haddock, we were able to estimate that if these fish--instead of being caught and killed in the small mesh of the otter trawl--had been left on the Bank until 1948, it would have been possible for the industry to have harvested at least an additional 30,400,000 pounds.

Assuming that the 1948 production turns out to be about 90,000,000 pounds (a reasonable estimate), this additional potential poundage would have amounted to a total increase in production for this Bank of about 34 percent. Increasing production by over one-third with no increase in the cost of production would appear to be highly desirable, especially in the light of present world food shortages.

On the basis of current prices being paid for scrod haddock ($1\frac{1}{2}$ to $2\frac{1}{2}$ pounds), such an increased production in 1948 would have brought the industry approximately an additional $3,000,000 (ex-vessel values only).

Haddock research that is planned for the future includes: a complete summary of all Georges Bank studies made to date; additional mesh experiments, utilizing the Fish and Wildlife Service's new research vessel, Albatross III; a more accurate determination of abundance and factors affecting abundance, with the use of this vessel on Georges Bank; and an analysis and summary--if additional personnel become available--of all accumulated biological data on the Nova Scotian populations of haddock.

## PLANTING AND MARKETING OYSTERS IN THE PACIFIC NORTHWEST

Growers who take the best care of their Pacific oysters follow the practice of "breaking." Many small oysters will be found on one seed shell. As these grow, some will die but there may be too many for best growth. When crowded, the oysters, not being able to expand sideways, grow long and ill-shaped. When the oysters are old enough to survive the process of breaking, the grower sends men over the ground at low tide when the beds are exposed. These men, equipped with small wedge-shaped hammers, turn the clusters over and strike the old seed shell at the base of the cluster, thus shattering the cluster. For best growth, single oysters are preferable, and no more than three oysters should be left with a single attachment. Owing to the high cost of labor, hand-breaking is being discontinued and some operators pass a drag across the bed at high tide. The drag tends to turn the clusters over and break them apart. As the shell of the Pacific oyster is not very strong, some oysters are killed by "breaking."

—Fishery Leaflet 52

# FAT IN FISH MEAL

By M. E. Stansby*

Tests carried on in laboratories of the Fish and Wildlife Service during the past ten years have shown that when the fat content of fish meal is determined by conventional methods, that is, by extraction with ethyl ether, the apparent fat content drops during even short storage periods. After six months to a year, values obtained are as low as 30 percent of the original. It has also been shown that when acetone is substituted for ethyl ether, much higher recoveries of the initial fat are obtained, although a small drop in the apparent fat content does take place after extended storage periods.

More recent studies have shown that somewhat higher results are obtained with certain mixed solvents than with acetone, but other difficulties in technique have thus far prevented the use of such mixed solvents on a routine basis. Inasmuch as such extremely low values are obtained when using conventional methods, it seemed advisable to test the acetone-extraction method on a collaborative basis even though it has not been perfected. Accordingly, during the past year such a collaborative analysis has been conducted.

Before starting the collaborative analysis, it was necessary to standardize on a procedure. In preliminary experiments carried out during the past years, it was customary to first extract the meal with acetone, then to evaporate the acetone and redissolve the fat in ethyl ether. This solution was then evaporated and the ether-soluble material weighed as fat. This purification step was carried out to be certain that the acetone was not dissolving extraneous material and the final reported value represented true fat. Extensive experience with this procedure, however, showed that the gross, unpurified acetone extract obtained from old meals was never higher than the purified ether extract of the same meal in the fresh condition nor was it higher than the initial fat content as determined by standard AOAC procedure. Thus, once having shown that the acetone extract contained no significant amount of extraneous materials, it was felt that, for routine analyses, it would be unnecessary to include the so-called "purification" step. By merely weighing the crude acetone extract, a minimum value would be obtained which in no case would be higher than the true fat content of the meal. Accordingly, no purification with ethyl ether was included in the final procedure as adopted for the collaborative analysis.

Another decision which had to be made was whether a second step, namely hydrolysis of the extracted meal with acid, followed by a second extraction, should be included in the standardized method. Previous tests had shown that a considerable amount of additional fat could be extracted from meals in this way, especially from meals which had been stored for a considerable length of time. Such a hydrolysis and extraction procedure on fresh meals usually yielded about 1 percent additional fat by this method. For very old meals, a considerably larger proportion of the fat was not extracted by the initial solvent but could be obtained by this hydrolysis procedure. Accordingly, in order to more nearly determine the true fat content in older meals, it was decided to include the acid hydrolysis in the standard procedure. By so doing, the value obtained for the initial fat content of fresh meals is increased by about 1 percent over values which would have been obtained had this process not been included.

* Chemist, In Charge, Fishery Technological Laboratory, Branch of Commercial Fisheries, Seattle, Washington.

Following is the procedure exactly as sent to collaborative laboratories for this analysis:

FAT DETERMINATION IN FISH MEALS

I. Acetone method.

Weigh four to five grams of the meal to the nearest 1/100 gm. into an alundum or paper extraction thimble, cover with a light layer of cotton, and extract in a Bailey-Walker or Underwriters type continuous extraction apparatus for 16 hours, using acetone as the solvent. If this type extraction equipment is not available, Soxhlet or other types may be used, but a notation describing the type used should be made with the report on results obtained.

At the end of the extraction period, distill off acetone until volume in flask is 10-15 ml. Transfer this oil solution to a 100 ml. tared beaker, washing flask free of all oil with fresh acetone, and evaporate with a current of warm air. A convenient method is to place flask on a grill (e.g. over a steam radiator) and place in front of a small electric fan.

When no moisture or acetone can be observed, place beaker in a vacuum oven at 80° C. and apply a vacuum of 24 to 25 inches for 1 hour. Transfer to desiccator, cool, and weigh.

Next, transfer the extracted meal residue from the thimble to a 150 ml. beaker. Remove any remaining solvent by heating on a warm grid and then add 60 ml. 4N HCl. Digest for one hour at or near the boiling point, occasionally stirring with a glass rod. Heat on a hot plate for which the temperature can be controlled and add water as necessary to maintain volume in the beaker. (Note: Thorough removal of all acetone is necessary preliminary to this digestion for otherwise vaporization of solvent will carry meal particles over side of vessel on to hot plate.) Filter through a 12.5 cm. fluted filter. Wash residue on filter until free of acid, using methyl red indicator on portions of filtrate to follow progress of washing. Place filter and meal in a 150 ml. beaker and dry in air oven at 80-90° C. for one hour. Transfer filter paper and contents to a thimble and extract 16 hours with acetone. Finish removal of solvent and weighing of extract as with initial extraction.

II. AOAC method.

Determine oil content by the official AOAC method for grain and stock feeds as described on page 408 of the sixth edition of "Methods of Analysis AOAC", under section 27.24 and 27.25, first drying the meal as described under section 27.3. It should be noted that in drying to constant weight, ordinarily, a truly constant weight will never be attained with fish meal because both loss in weight due to evaporation of moisture and gain of weight due to oxidation of fish oils (even in vacuum oven) occur simultaneously. Drying is therefore discontinued after the sample ceases to lose weight.

Average results obtained in the collaborative analysis are shown in Table 1 while individual determinations in triplicate reported by the different laboratories are given in Table 2. The meal used in this collaborative assay was an experimental pilchard meal[1/] prepared in the pilot plant of the Seattle Fishery Technological Laboratory of the Fish and Wildlife Service on September 25, 1946. The meal was stored in a paper bag at room temperature under conditions similar to

1/ The meal was prepared by a method somewhat similar to commercial wet process rendering, but on a small scale. This involved cooking the pilchard with steam, pressing out oil in a hydraulic press, and drying the meal. The latter step differed from commercial practice in that a tunnel drier was employed using a blast of air at 150° F.

those prevailing in the storage of commercial meals. A large sample was withdrawn during the latter part of April 1947, ground, and mixed thoroughly to insure homogeneity. Samples were placed in glass-stoppered paraffined bottles and mailed to collaborative laboratories with instructions that all tests should be run during the 10-day period of May 10 to May 20. As shown in Table 1, the average fat content of the meal had fallen from the original 14.75 percent in the freshly prepared meal (when determined by the ether extract method) to an apparent value of 14.66 percent when determined by the acetone method. A value of only 5.33 percent was obtained by the ether extract method (AOAC).

Table 1 - Average Values for Fat in Fish Meal as Reported by Collaborative Laboratories

| Laboratory | Fat Content of Pilchard Meal Stored 7½ Months | | | |
|---|---|---|---|---|
| | Acetone Extraction Method | | | AOAC Ethyl Ether Method Extract |
| | Initial Extract | Acid Hydrolysis Extract | Total Extract | |
| | Percent | Percent | Percent | Percent |
| A ..... | 11.15 | 2.57 | 13.72 | 5.25 |
| B ..... | 13.32 | 2.57 | 15.67 | 4.92 |
| C ..... | 11.9 | 3.7 | 15.6 | 5.8 |
| D ..... | 11.0 | 2.1 | 13.1 | 4.57 |
| E 1/ ..... | 12.31 | 2.05 | 14.36 | 6.12 |
| F ..... | 13.5 | 2.5 | 16.0 | 5.7 |
| G ..... | 11.38 | 2.80 | 14.18 | 4.97 |
| Average ..... | 12.08 | 2.58 | 14.66 | 5.33 |
| | Initial fat content of freshly prepared meal | | | |
| | 17.96 | 0.93 | 18.89 | 14.75 2/ |

1/ Soxhlet extraction equipment was used by laboratory E.
2/ With hydrochloric acid digest extraction included this value was 16.96 percent.

There was no outstanding difference in precision between the AOAC method and the acetone method either in regard to reproducibility between the triplicate samples run within the same laboratory or with respect to differences between individual laboratories. As a rule, individual laboratories were able to obtain checks between the triplicate determinations better than they checked each other and this was true with both the acetone extraction method and the AOAC method.

Table 2 - Precision Attained by Individual Laboratories on Acetone and Ethyl Ether Extraction of Fish Meal

| Laboratory | Fat Content of Meal | | | |
|---|---|---|---|---|
| | Initial Extract | Acid Hydrolysis Extract | Total Extract | AOAC Ethyl Ether Method Extract |
| | Percent | Percent | Percent | Percent |
| A | 11.21; 11.27; 10.98 | 2.75; 2.32; 2.65 | 13.96; 13.59; 13.63 | 5.17; 5.27; 5.33 |
| B | 13.10; 13.18; 13.68 | 2.05; 2.77; 2.24 | 15.15; 15.95; 15.92 | 4.93; 4.90; 4.92 |
| C | 10.8; 12.0; 11.9 | 4.0; 3.5; 3.7 | 14.8; 15.5; 15.6 | 6.0; 5.7; 5.8 |
| D | 11.2; 10.6; 11.0 | 2.1; 2.1; 2.1 | 13.3; 12.7; 13.1 | 4.55; 4.70; 4.60 |
| E | 12.24; 12.17; 12.51 | 1.99; 2.08; 2.09 | 14.23; 14.25; 14.60 | 6.00; 6.20; 6.07 |
| G | 11.14; 11.48; 11.51 | 3.00; 2.72; 2.67 | 14.14; 14.20; 14.18 | 4.93; 4.98; 5.00 |

NOTE: Laboratory F results not shown because they were not reported in triplicate.

While absolute differences were greater in the case of the acetone extraction method, relative percent differences were about the same. Values obtained for the acetone extraction fat determinations were about three times as high as those for the AOAC method, and differences between duplicate samples and individual laboratories were likewise about three times as high. Thus, the relative difference was of the same order of magnitude for the two different methods. On

the whole, the precision was not nearly as good as could be desired, and future studies should be carried out to determine the cause for such lack of precision and, if possible, to improve upon the procedure in order to obtain better agreement.

In spite of the fact that the acetone extraction method does not give ideal and complete extraction of fat from old meals and that the degree of precision is not all that could be expected, the results by this method are so far superior to those obtained by ethyl ether extraction that it is felt the acetone method should be adopted tentatively pending improvements which may require a considerable number of years to be attained. Accordingly, the following recommendations are made:

1. It is recommended that the acetone extraction procedure as outlined above be made tentative.

2. That study be continued to improve the precision of the above outlined acetone extraction procedure.

3. That studies be continued on the use of other solvents or mixtures of solvents which might eventually lead to a better procedure than is possible by the use of acetone.

LIST OF COLLABORATIVE LABORATORIES

Commonwealth of Virginia
Department of Agriculture and Immigration
Division of Chemistry
Richmond, Virginia

Maine Agricultural Experiment Station
Orono, Maine

State of California Department of Agriculture
Sacramento, California

State of Michigan Department of Agriculture
Lansing, Michigan

U. S. Department of the Interior
Fish and Wildlife Service
Fishery Technological Laboratory
Seattle, Washington

Wirthmore Research Laboratory
Malden, Massachusetts

## THE OYSTER AND THE OYSTER INDUSTRY IN THE UNITED STATES

The oyster industry in the United States is one of the very valuable fishery industries, yielding annually (1938-1942) from 75 to about 90 million pounds of oyster meat and giving to our fishermen an annual income varying from 7.5 to 11.8 million dollars. Three species are of commercial value: Ostrea virginica, the eastern oyster; O. lurida, so-called Olympia oyster of the Pacific Coast; and O. gigas, a Japanese oyster introduced into the United States.

—Fishery Leaflet 187

# GULF COAST SHRIMP FISHERIES, JANUARY-JUNE, 1948

By S. C. Denham*

## INTRODUCTION

The purpose of this report is to summarize current shrimp production information and to review a number of factors affecting the shrimp fisheries of the Gulf Coast during the first half of 1948. Accurate and current information is essential to sound business operations, while the lack of it restricts normal marketing processes.

During the first half of 1948, shrimp landings in the Gulf area have been larger, imports have increased greatly, cold storage holdings of shrimp have remained at a higher level, and wholesale prices have fluctuated more than during the same period last year.

## PRODUCTION

Shrimp landings during the first six months of 1948 in the Gulf area were 15 percent greater than during the same period last year. Landings were greatest in May, with April and January showing the next largest production. This increased catch was made by the fishing fleet even though it was handicapped by adverse weather conditions and two periods of inactivity caused by disputes.

Of the total domestic shrimp catch of the Gulf area, the greatest quantity is landed in Louisiana. In 1947, landings in Louisiana accounted for 65 percent; Texas, 17 percent; Mississippi, 13 percent; Alabama, 3 percent; and Florida (Gulf Coast only), 2 percent.

Table 1 - Shrimp Landings, Gulf Coast - January-June

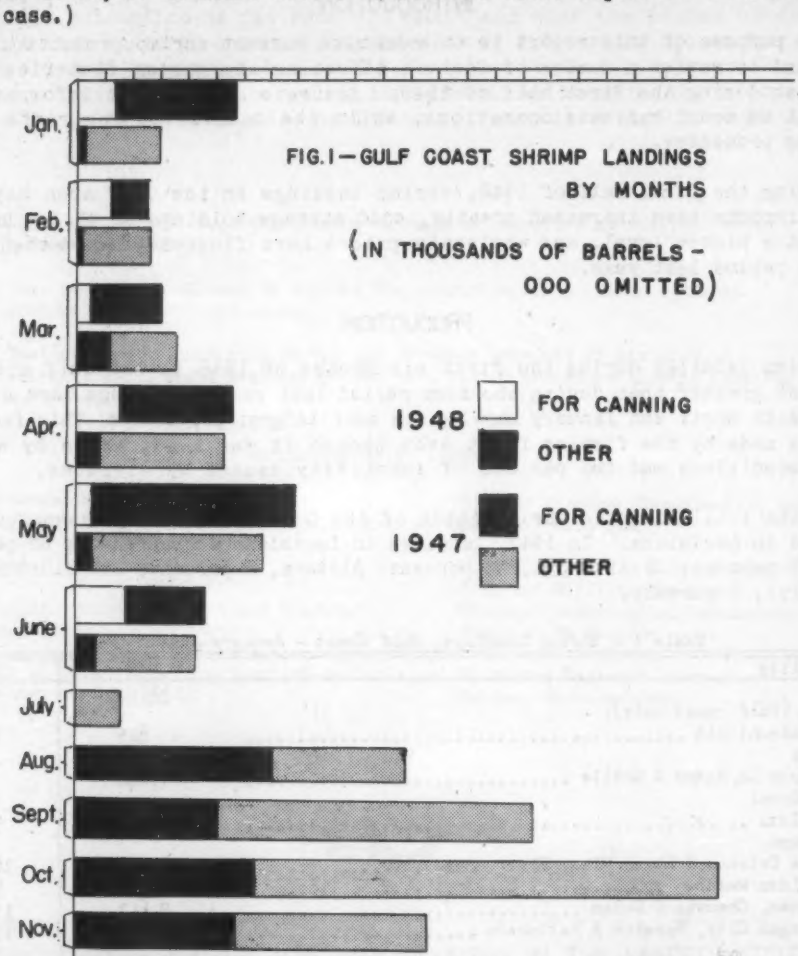
| Locality | 1948 | 1947 |
|---|---|---|
| | bbls. | bbls. |
| Florida (Gulf coast only): | | |
| Apalachicola | 615 | 1,799 |
| Alabama: | | |
| Bayou La Batre & Mobile | 1,148 | 801 |
| Mississippi: | | |
| Biloxi | 13,208 | 9,805 |
| Louisiana: | | |
| New Orleans & Lower Miss. River area | 23,049 | 16,977 |
| Golden Meadow | 9,046 | 9,208 |
| Houma, Chauvin & Dulac | 9,617 | 13,138 |
| Morgan City, Berwick & Patterson | 15,864 | 11,718 |
| Texas: | | |
| Galveston, Freeport & Sabine Pass | 8,291 | 6,840 |
| Pt. Lavaca & Palacios area | 1,898 | 2,921 |
| Aransas Pass & Rockport | 5,218 | 4,296 |
| Port Isabel | 1,150 | * |
| Total | 89,104 | 77,503 |

*Not available.

Note: A barrel contains 210 pounds of heads-on shrimp and equals 125 pounds of heads-off shrimp.

* Fishery Marketing Specialist, In Charge, Fishery Market News Service Office, Branch of Commercial Fisheries, New Orleans, La.

Although the bulk of the canned shrimp production is produced during the last four months of the calendar year, some shrimp are packed during the other months. On the basis of the quantity of shrimp reported used for canning, it is estimated that approximately 66,000 standard cases were packed during the first half of this year in the Gulf area, while during the same period last year the shrimp pack is estimated at 38,000 standard cases. (Standard cases represent 48 7-ounce cans to the case.)



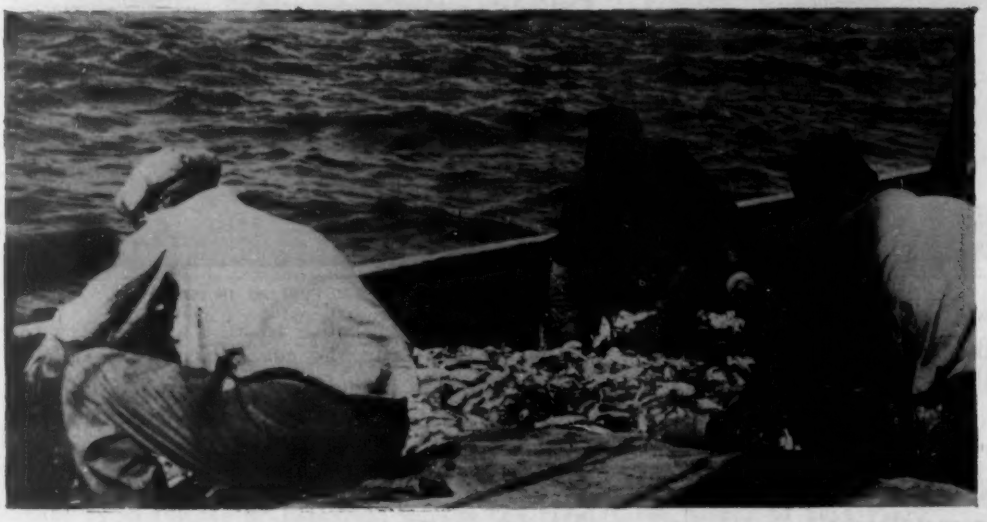

Strong winds and inclement weather conditions affect shrimping operations adversely even though the winds are not always of sufficient intensity for the Weather Bureau to order small craft warning signals to be displayed. However, some indication of the weather conditions prevailing for various periods can be ascertained by the number of times small craft and storm warnings are displayed.

During the first 6 months of 1948, small craft warnings were displayed over the major portion of the Gulf coastal area at least 16 times for periods ranging from 24 to 48 hours duration. The warnings were displayed 4 times in January, 4 times in February, 7 times in March, and once in April. During the same period in 1947, small craft warnings were hoisted on at least 11 occasions. In spite of this greater number of days in port, the fleet was able to make greater landings in the first half of 1948.

Shrimp fishing craft were tied up twice because of disputes over prices, or other controversies between fishermen and dealers in two sections of the Gulf Coast. One was on the Texas coast at ports from Port Lavaca to Brownsville, for approximately four weeks in March and April, while the other was at Morgan City, Berwick, and Patterson, La., from about February 12 to March 11.

## GROOVED OR "RED" SHRIMP

Part of the increased catch has been of the grooved or "red" shrimp. Three varieties of salt-water shrimp are found in the commercial catch of the Gulf area. They are commonly known as common shrimp, grooved or Brasilian shrimp, and seabobs. There is also a fresh-water river shrimp which is taken in the lower Mississippi and Atchafalaya Rivers in Louisiana, but on account of its small size and low volume of the catch is only of minor economic importance. No accurate information is available yearly on the quantity of each of the salt-water varieties which comprise the domestic shrimp catch. According to estimates by Weymouth, Lindner, and Anderson (1933), the common shrimp makes up 95 percent; the grooved shrimp, 2½ percent; and seabobs, 2½ percent of the total yearly catch, although this will vary depending on the time of year and section of the Gulf Coast.



SORTING SHRIMP ABOARD A SHRIMP TRAWLER IN THE GULF

The seabob is of small size and produced mainly from the shallow coastal waters of Louisiana. It is only of importance locally where the greater bulk is used by drying platforms, although some are used for canning, and a nominal amount are sold to the local raw trade.

WASHING SHRIMP ABOARD A GULF SHRIMP TRAWLER BEFORE PUTTING IN HOLD

The grooved shrimp, on the other hand, is comparable in size and quality to the common shrimp. The grooved shrimp differs from the common shrimp in minor structures and by an inherent reddish-like color peculiar to the grooved shrimp.

It is common knowledge that when deterioration of common shrimp reaches a stage that it would be considered generally poor or only fair quality, a distinctive reddish color appears. Because of this fact, the trade has long associated the appearance of a reddish color with poor quality shrimp. Thus, difficulty is encountered in selling the grooved shrimp. Even though the quantity of grooved shrimp caught is generally very small in proportion to the total yearly catch, there are times when grooved shrimp may make up a goodly portion of the daily catch and at such time sales difficulty may be encountered.

During the first six months of 1948, especially from January through April, large grooved shrimp made their appearance in appreciable quantities in the commercial catch. The trade resistance to the purchase of grooved shrimp reached a

climax in certain localities in Texas when a fisherman could not find a market for that variety even though daily catches were not great.

Beginning May 1, very small grooved shrimp were caught in shallow coastal waters of the Gulf. In Louisiana, the minimum size limit of 68 heads-on shrimp per pound is not applicable to the grooved shrimp from May 1 to the beginning of the closed season. The closed season for inside Alabama waters does not apply to the catching of grooved shrimp from June 28 to July 12, 1948. The majority of these small shrimp were dried, some were canned, some prepared as cooked-peeled shrimp, and small quantities were sold to the raw trade. By the middle of June, grooved shrimp ranging mostly from 30 to 50 per pound were being caught and some were sold at the French Market in New Orleans without much difficulty because of the local scarcity of the common shrimp.

## IMPORTS

Imports of shrimp from the Gulf Coast of Mexico were very much greater in the first 6 months of 1948 than during the same period last year (Table 2). The quantity of shrimp imported for consumption through the Customs districts on the Gulf Coast were, according to U. S. Customs figures, 2,718,783 pounds for the months of January through June 1948. The greatest quantity entered through the ports of Brownsville, Port Isabel and Laredo, all within the Laredo Custom district. New Orleans and Morgan City, La., of the New Orleans district, imported the next greatest quantity. In contrast, imports entered at the Laredo district were only 59,061 pounds during the first 6 months of 1947, and none for the other Customs districts on the Gulf Coast. Shrimp imports from the east coast of Mexico were also made through Miami, in the Florida district. None was received through this district in 1947.

Table 2 - Shrimp Imports from Mexico at Gulf States and Florida Ports

| Month | 1948 | | | | 1947 | | | |
|---|---|---|---|---|---|---|---|---|
| | Customs District | | | | Customs District | | | |
| | Florida | New Orleans | Laredo | Total | Florida | New Orleans | Laredo | Total |
| Jan. .... | 6,357 | 147,261 | 102,201 | 255,819 | - | - | - | - |
| Feb. .... | 37,858 | - | 221,778 | 259,636 | - | - | - | - |
| Mar. .... | 96,115 | 92,435 | 408,230 | 596,780 | - | - | - | - |
| Apr. .... | 126,410 | 171,048 | 253,154 | 550,612 | - | - | - | - |
| May ..... | 118,587 | 166,750 | 244,659 | 529,996 | - | - | 4,700 | 4,700 |
| June .... | 157,198 | 147,425 | 221,317 | 525,940 | - | - | 54,361 | 54,361 |
| Total... | 542,525 | 724,919 | 1,451,339 | 2,718,783 | - | - | 59,061 | 59,061 |

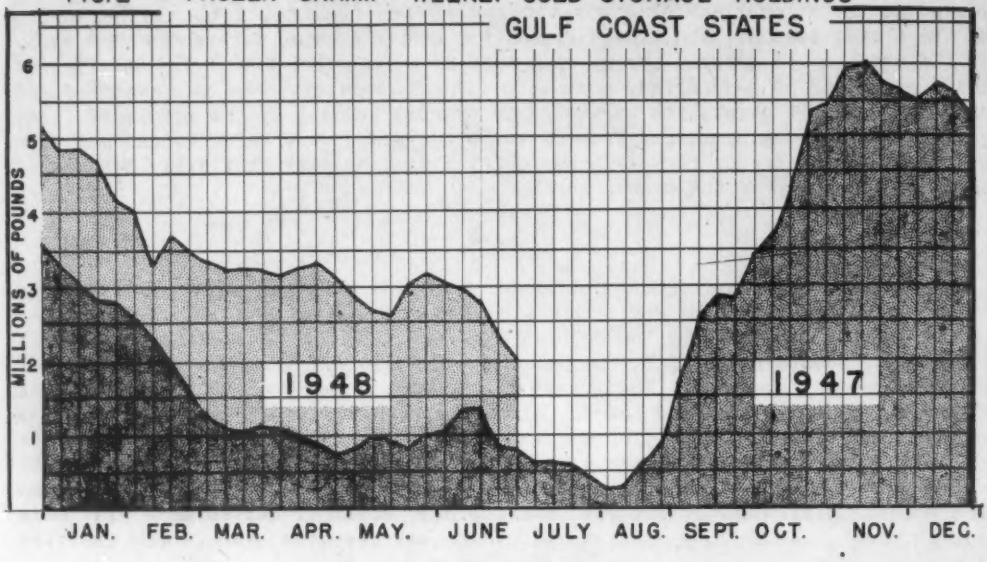
In 1947, when it became generally known that only fishing vessels of Mexican registry could legally operate for shrimp in those waters of the Gulf of Mexico under the jurisdiction of Mexico, a number of United States documented vessels transferred to Mexican registry. Records indicate that in 1947, 48 fishing vessels documented in the United States were released for transfer to Mexican registry, and from January 1 to May 27, 1948, 71 additional fishing vessels were transferred. Ciudad del Carmen on the Bay of Campeche has been the base of operation for practically all the former American shrimp vessels, with some fishing active off the coast of the State of Veracruz, during the first three months of this year.

## COLD STORAGE HOLDINGS

Cold storage holdings of frozen shrimp from January through June 1948, as reported by 13 warehouses of the Gulf States has varied from a peak of approximately 5,160,000 pounds on January 1 to a low of 2,047,000 pounds on July 1 (Figure 2). During the same period last year, 11 warehouses reported a maximum of 3,629,000

pounds on January 2 and a minimum of 713,000 pounds on April 24. Compared to the total frozen shrimp holdings, the percentage decrease from the January peak has been less this year than the corresponding period in 1947.

FIG. 2 — FROZEN SHRIMP- WEEKLY COLD STORAGE HOLDINGS— GULF COAST STATES




## WHOLESALE PRICES

Generally, shrimp wholesale prices were higher during the first quarter than during the second quarter of 1948, while in 1947, the reverse was generally true. Price fluctuations were greater during the first half of this year than during the same period in 1947.

Shrimp wholesale prices on the French Market in New Orleans remained higher during the first six months of 1948,with the exception of March and June, when the price was about the same as the same period in 1947. The peak price for jumbo shrimp (15 and less heads-on shrimp per pound) in 1948 ranged from $72.00 a barrel in May to $90.00 a barrel, in February, March, May and June. During the same period in 1947, the peak price ranged from $66.00 in April to $90.00 a barrel in March and June for jumbo shrimp. Smaller size shrimp were correspondingly lower. (A barrel of shrimp contains 210 pounds of heads-on shrimp, which for all practical purposes is considered equivalent to 125 pounds of heads-off shrimp.)

During the first quarter of 1948 the wholesale prices of jumbo shrimp (numbering, heads-off, 25 and less per pound) on the wholesale salt water fish market in New York City were higher, while during the second quarter, lower prices prevailed than during the corresponding period in 1947 (Figures 3 and 4), according to the New York Fishery Market News Service reports. From January through June of this year, the average weekly fluctuations in wholesale prices for fresh jumbo shrimp in New York City was 7.7 cents per pound in contrast to an average weekly variation of 6.3 cents per pound during the same period in 1947.

The wholesale prices of frozen jumbo shrimp (25 and less per pound) in Chicago during January and most of February was slightly higher than the same period in 1947, according to the Chicago Market News Service reports. During April, May,

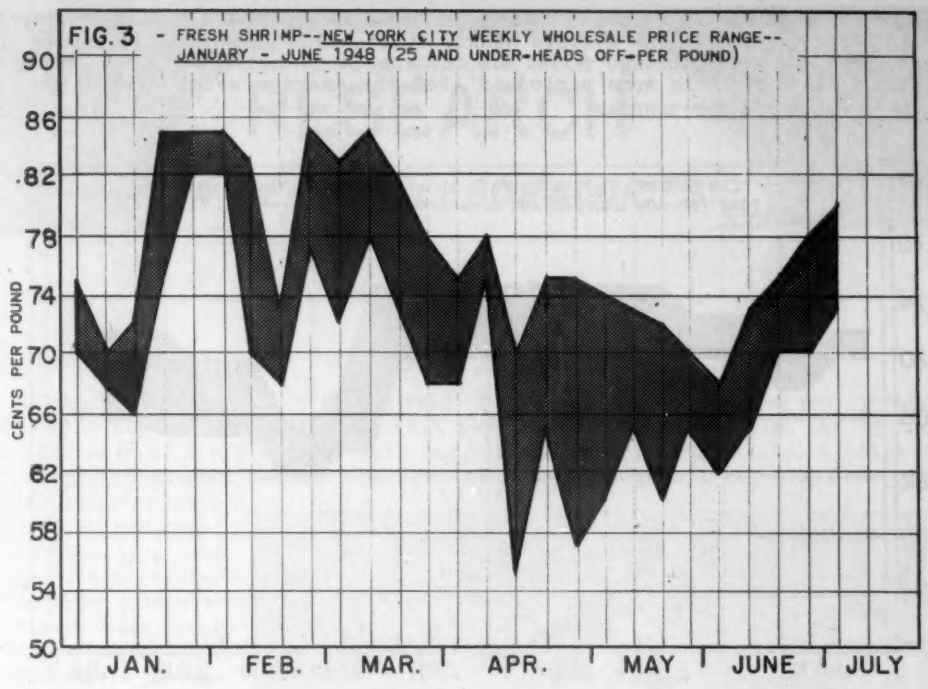


FIG. 3 - FRESH SHRIMP--NEW YORK CITY WEEKLY WHOLESALE PRICE RANGE--
JANUARY - JUNE 1948 (25 AND UNDER-HEADS OFF-PER POUND)
CENTS PER POUND
90
86
82
78
74
70
66
62
58
54
50
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY

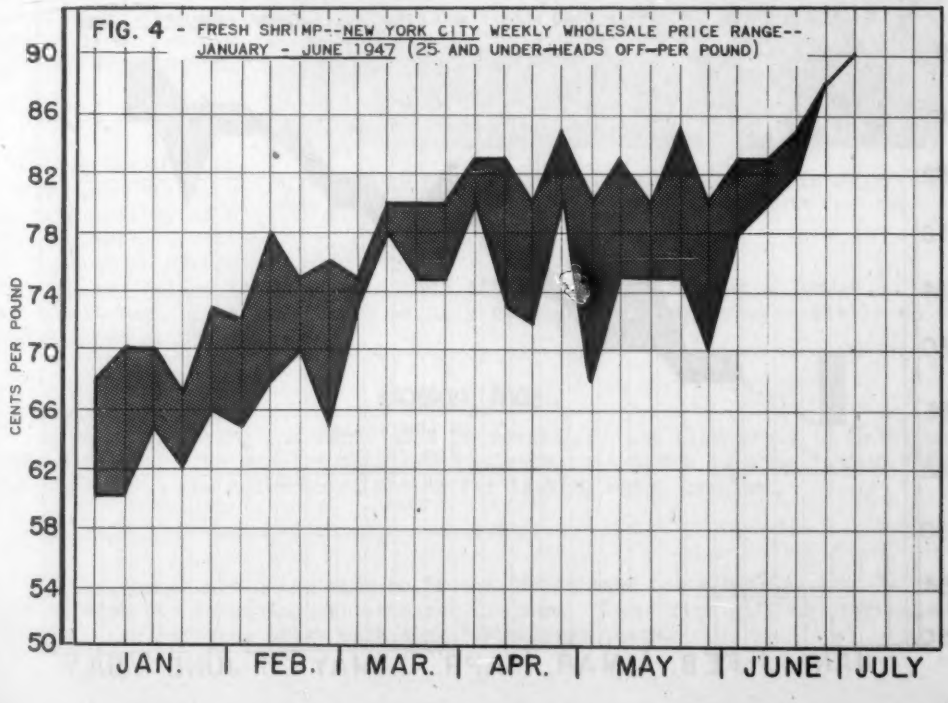
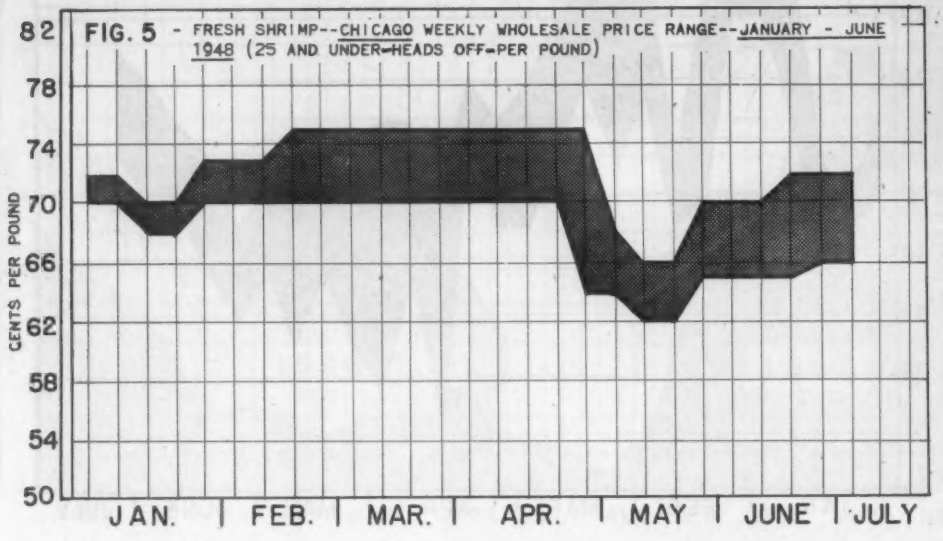
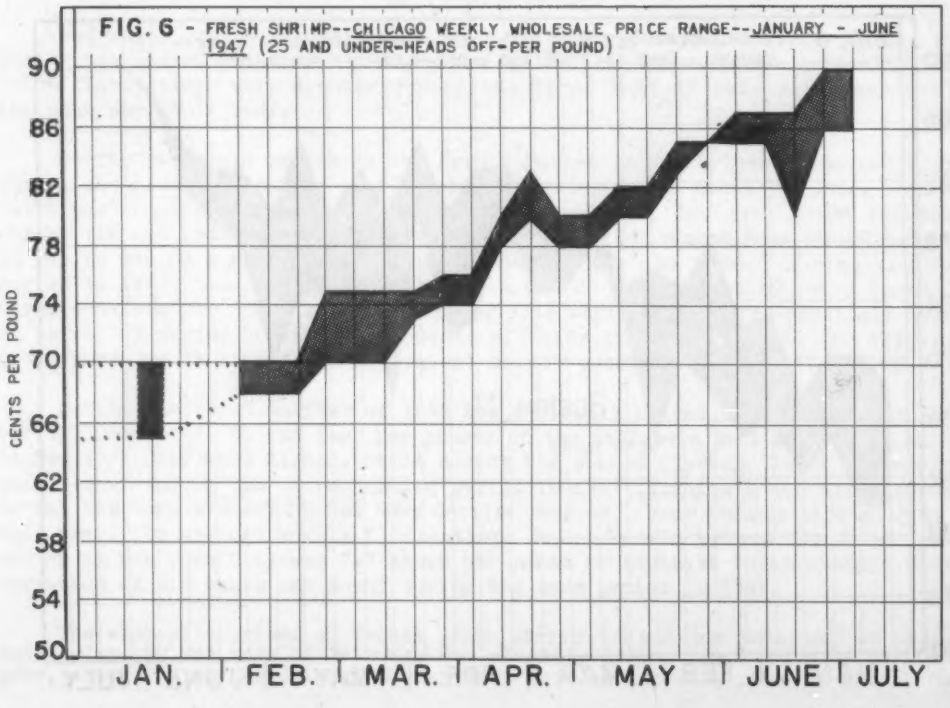


FIG. 4 - FRESH SHRIMP--NEW YORK CITY WEEKLY WHOLESALE PRICE RANGE--
JANUARY - JUNE 1947 (25 AND UNDER-HEADS OFF-PER POUND)
CENTS PER POUND
90
86
82
78
74
70
66
62
58
54
50
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY

and June 1948, the price ranged considerably lower than during the same period in 1947 (Figures 5 and 6). The average weekly fluctuation in wholesale prices of frozen jumbo shrimp in Chicago varied 4.6 cents per pound during the first 6 months of 1948, while during the same period in 1947 the average weekly variation in price was 2.8 cents per pound.



# RESEARCH IN SERVICE LABORATORIES

## AUGUST 1948

### Beaufort, N.C.

A small shrimp trawl, with a spread of 12 feet, was constructed and operated to test the survival of young fish that were able to escape through the 2½-inch stretched mesh of a new type of tail bag. In 16 experimental hauls, a total of 864 young fish escaped through the special mesh of the tail bag and were collected in a larger tail bag of 7/8-inch mesh, which is the type used on most of the regular shrimp trawls. Over 96 percent of these young fish, 4 to 7 inches long survived their passage through the new type bag. A trawl with a spread of 30 feet has been ordered for use in future experiments.

* * *

PLANTING FOSSIL SHELL MATERIAL--"BELGRADE ROCK"--FOR COLLECTING SEED OYSTERS AT THE NORTH RIVER EXPERIMENTAL OYSTER FARM AND BEAUFORT, N. C. SERVICE LABORATORY

A series of tests were made to determine the suitability of a type of fossil rock to be planted on oyster beds for the collection of oyster spat. After a two-week setting of oyster larvae, the fossil rock was covered with as many spat as the clean oyster shells which were planted at the same time.

### Boston, Mass.

A report covering the tests made in several of the clam areas in Maine has been completed. The results obtained indicate that there is some factor which interferes with the enterococci method for testing water samples.

* * *

Arrangements are being made to freeze fish aboard the Albatross III, in connection with the technological research program. These fish will be defrosted, filleted, and refrozen after packaging for storage tests.

## College Park, Md.

Twenty-eight portions of cooked fishery products, as prepared for serving, have been analyzed for nutritive value as represented by proximate analyses.

* * *

Two hundred packages of mackerel fillets were packaged and frozen for storage. These fillets will be used to study the effect of the fluctuation of temperature on the quality of fish.

* * *

Commercial canners in New Jersey were advised concerning canning techniques for "little tuna."

* * *

Palatability tests were conducted using recipes for halibut, crabs, and shrimp. Also, ten lots of canned fish sandwich spreads were tested.

## Seattle, Wash.

Collection of samples of salmon cannery waste were resumed. The objective is the development of a product for use as hatchery food. Work will be limited largely to determining the value of hatchery food prepared from different parts of the waste. Accordingly, in collecting the samples, it was necessary to sort the waste before freezing. Samples of roe, milt, liver, and digestive tract were obtained.

* * *

The vitamin A content of a sample of shark livers collected at Bikini was found to be too low for commercial utilization.

* * *

Three lots of flounders (rock, yellowfin, and lemon) frozen round aboard the Pacific Explorer in the Bering Sea were thawed, filleted, packaged in cellophane, and refrozen in the sharp freezer at -20° F. After storage for two weeks at 0° F., an organoleptic examination was made in which the refrozen fillets were compared to fillets which had been prepared, packaged, and frozen aboard vessel. In general, tasters found the color, texture, and flavor of the refrozen fillets as satisfactory as those prepared aboard vessel. Lemon flounder, a species not previously studied, were found to be lacking in the normal color and flavor of the flounder family, and both the refrozen and vessel frozen fillets were rated lower in quality than the other species.

* * *

Four lots of king crab meat frozen aboard the Pacific Explorer in the Bering Sea and stored at 0° F. for 10 weeks, showed little difference in color, texture, and flavor whether frozen in tin cans, with and without brine added, or in cellophane. In general, the comparison of this meat with that stored for almost a year, indicates that the primary changes in the crab meat in storage at 0° F.

are slight loss of normal texture and flavor, and discoloration of meat packaged in brine or in a loose package with access to air.

* * *

Commercially prepared rockfish fillets, which had been packaged in cellophane and stored for 34 weeks at 0° F. were found to be entirely inedible due to rancidity in the surface fat layer. Fillets from which the fat layer had been removed before packaging and freezing were entirely edible and of fair commercial quality.

## BROILED SALMON STEAKS

2 pounds salmon steaks
1 teaspoon salt
1/8 teaspoon pepper
4 tablespoons butter or other fat, melted.

Cut fish into serving size portions. Sprinkle both sides with salt and pepper. Place fish on a preheated greased broiler pan about 2 inches from the heat. Brush fish with melted fat. Broil for 5 to 8 minutes or until slightly brown, baste with melted fat and turn carefully. Brush other side with melted fat and cook 5 to 8 minutes or until fish flakes easily when tested with a fork. Remove carefully to a hot platter, garnish, and serve immediately, plain or with a sauce. Serves 6.

Other steaks or fillets may be used in the above recipe.

## Additions to the Fleet of U. S. Fishing Vessels

One hundred nineteen vessels of five net tons and over were documented as fishing craft during July, 17 less than in the previous month, and 21 less than in July 1947, according to the U. S. Bureau of Customs. California led with 22 vessels, Washington with 15, and Texas and North Carolina with 9 each. A total of 682 vessels were documented during the first seven months of 1948, compared with 782 during the same period in 1947.

Vessels Obtaining Their First Documents as Fishing Craft

| Section | July | | Seven mos. ending with July | | Total |
|---|---|---|---|---|---|
| | 1948 | 1947 1/ | 1948 | 1947 1/ | 1947 1/ |
| | Number | Number | Number | Number | Number |
| New England | 6 | 9 | 32 | 34 | 55 |
| Middle Atlantic | 3 | 2 | 30 | 37 | 64 |
| Chesapeake Bay | 9 | 14 | 29 | 50 | 83 |
| South Atlantic and Gulf | 48 | 34 | 275 | 247 | 486 |
| Pacific Coast | 40 | 62 | 217 | 278 | 415 |
| Great Lakes | 4 | 6 | 29 | 23 | 45 |
| Alaska | 7 | 8 | 63 | 96 | 123 |
| Hawaii | 2 | 5 | 7 | 16 | 28 |
| Puerto Rico | - | - | - | 1 | 1 |
| Total | 119 | 140 | 682 | 782 | 1300 |

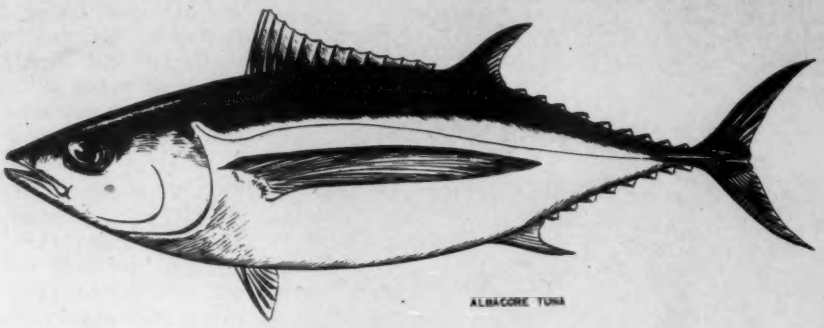
1/ Revised.

## Albacore Tuna Landed in Alaska

For the first time in the history of Alaska's fishing industry, albacore tuna were landed on August 24 at Ketchikan, Alaska, when four trolling vessels brought in 62,000 pounds. During the period August 24 to September 30, 1948, a total of 42 trips were reported with landings of 360,500 pounds. The average weight of the tuna landed in Ketchikan was 14 pounds, with the fish running larger than those found off the California and Oregon coasts. Fishermen sold these albacore at prices ranging from $500.00 to $530.00 per ton with the majority being sold at $520.00-$525.00 per ton.

The appearance of tuna off the lower coast of Southeastern Alaska is rather unusual. According to reports, the fish were caught off Graham and Langara Islands and Dixon Entrance, or in a strip of water that extends about 100 miles along the Queen Charlotte Islands. Tuna are not only coming further north this year, but closer to the shore.

Although landings were quite steady from August 24 to September 3, since then only occasional catches have been made. Whether these landings will continue at




Ketchikan will depend upon whether or not the fish are available, prices, and the weather.

## "Albatross III" Reports Fish Scarce South of Nantucket

The scientists aboard the Albatross III, on its sixth cruise, August 3 to 7, found the commercially-important fish to be very scarce in the area south of Nantucket Island. Fourteen stations were occupied by the Service's research vessel in the area under study. The principal species caught were whiting and hake.

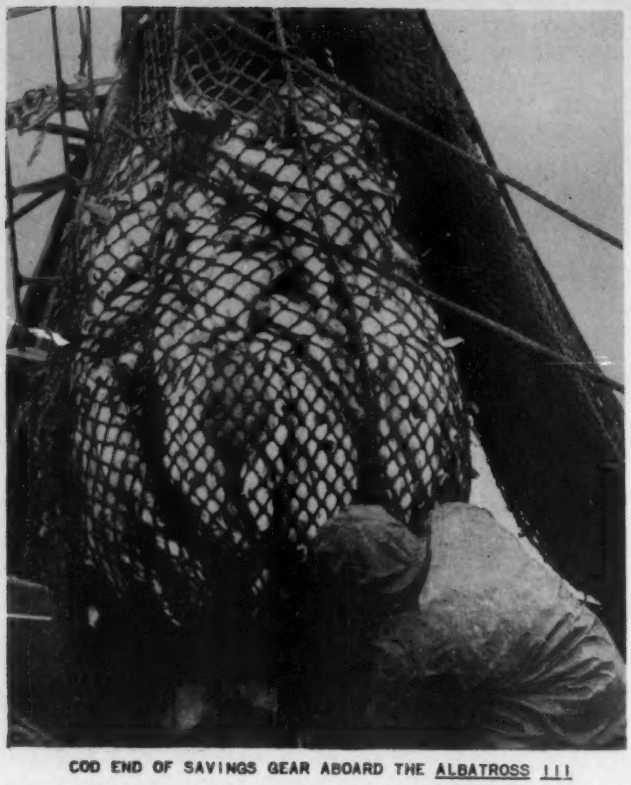
A bed of sea scallops was discovered about 3 miles southeast of Nantucket Shoals lightship in about 35 fathoms. Several bushels of these shellfish were obtained in two short tows.

An uncharted wreck of considerable size was discovered on August 5 about 12 miles south southwest of Nantucket Shoals lightship. The position, obtained by Loran is at 40° 26.5' N. latitude and 69° 46.5' W. longitude in 40 fathoms of water. The depth recorder indicates that it extends 48 feet off the bottom.

## Fish Census Continued by "Albatross III"

The census of fish on western Georges Bank was the major part of the scientific program conducted by the Albatross III on its seventh cruise, August 17-25.

The southwestern part of Georges Bank was found to be a major nursery ground for young haddock. Thousands of haddock hatched last spring, now 2 to 3 inches long, were caught in the fine-mesh trawls of the Albatross III.



COD END OF SAVINGS GEAR ABOARD THE ALBATROSS III

Large haddock and rosefish were found in commercial quantities in deep waters north of Georges Bank which are not now being fished. The area bounded by latitudes 42° 10' and 42° 20' and longitudes 67° 30' and 68° 30' was recommended to the fishing fleets.

A Boston University scientist accompanied the Service scientists on the cruise. He made extensive collections of fish parasites, especially of a copepod parasite on whiting.

Two of the haddock tagged on an earlier cruise of the research vessel were landed recently at the Boston Fish Pier. These are the first returns from haddock tagged with an otter trawl. One of them was caught near the point of release, the other migrated about 20 miles.

## California Research Vessel on Tuna Exploration

The 100-foot N. B. Scofield, research vessel of the California State Division of Fish and Game, was engaged during August in a six-week exploration for albacore and bluefin tuna in Pacific Ocean waters between the mainland and Hawaii, according to the July 28th issue of the California State Division of Fish and Game publication, Outdoor California.

By set lines, gill nets, and trolling, representative fish were caught for racial comparison with the tuna caught by commercial craft along the North and South American Coast.

The vessel, on a scouting trip in July, reported a "fair abundance" of albacore tuna sighted off the southern California Coast. The fish were found to be numerous in an area centering at a point 85 miles due west of Piedras Blancas Point in San Luis Obispo County.

# ECA Procurement Authorizations for Fishery Products

Among the procurement authorizations announced by the Economic Cooperation Administration for commodities and raw materials, the following are all the fishery products procurement authorizations from April 1, 1948 through September 30, 1948.

ECA Procurement Authorizations for Fishery Products

| Product | | Country of Origin | Procuring Agency[1] | Recipient Country | Amount Authorized | Month Approved |
|---|---|---|---|---|---|---|
| Fish, canned | Total | U.S. | Greece | Greece | $ 128,800 | Aug. |
| Fish, salted | | Newfoundland | Italy | Italy | 2,145,000 | Sept. |
| | | Canada | " | " | 195,000 | " |
| | Total | | | | 2,340,000 | |
| Fish meal | | Canada | Denmark | Denmark | 134,361 | June |
| | | Iceland | Austria | Austria | 170,000 | " |
| | | Norway | U.S. Dept. Army | Bizone Germany | 1,381,000 | Sept. |
| | Total | | | | 1,685,361 | |
| Oil, herring | Total | Iceland | U.S. Dept. Army | Bizone Germany | 1,694,000 | Aug. |
| " , seal | | Newfoundland | France | France | 134,400 | July |
| | | " | " | " | 123,200 | Aug. |
| | Total | | | | 257,600 | |
| " , technical fish | Total | U.S. | U.S. Dept. Army | Bizone Germany | 100,000 | Sept. |
| " , whale[2] | | Netherlands | Austria | Austria | 1,216,000 | June |
| | | Belgium | U.S. Dept. Army | Bizone Germany | 2,202,150 | Aug. |
| | | Norway | " " " | " " | 2,960,000 | May |
| | Total | | | | 6,378,150 | |
| Grand Total Approved | | | | | $12,583,911 | |

1/ Where the recipient country is shown as the procuring agency, the government of the participating country or its authorized agents or importers do the purchasing.
2/ Norwegian product.

ECA estimates that in the fifteen-months period from April 1, 1948 to June 30, 1949, they will authorize from ECA funds 53.3 million dollars for financing shipments of fishery products from the Western Hemisphere to the sixteen countries participating in the European Recovery Program.

# Federal Purchases of Fishery Products

DEPARTMENT OF AGRICULTURE: The purchasing of fishery products by the Department of Agriculture was discontinued in April when this activity was transferred to the U. S. Army. Therefore, this particular section will be discontinued with the November issue of Commercial Fisheries Review.

Purchases of Fishery Products by USDA

| Commodity | Unit | 1948 Quantity | 1948 Cost |
|---|---|---|---|
| FISH | | | Dollars |
| Fillets, cod, frozen | Lbs. | 4,080 | 1,428 |
| " , whiting, " | " | 2,385 | 598 |
| Total | " | 6,465 | 2,026 |
| Herring, canned[1] | Actual cases | 47,145 | 144,264 |
| Pollock, flaked, canned[2] | " " | 1,385 | 7,735 |
| Whiting, canned[1] | " " | 351 | 1,074 |
| Squid, " [2] | " " | 772,500 | 362,625* |
| Total | | 121,381 | 515,698 |
| Grand Total | | - | 517,724 |

1/ Actual cases contain 24 - 15 oz. cans.
2/ Actual cases contain 48 - 15 oz. cans.
*F.O.B. origin.

The total purchases of fishery products reported by the Department of Agriculture during the year 1948 were as shown in the preceding table. The purchases were made during the months of January, March, and April.

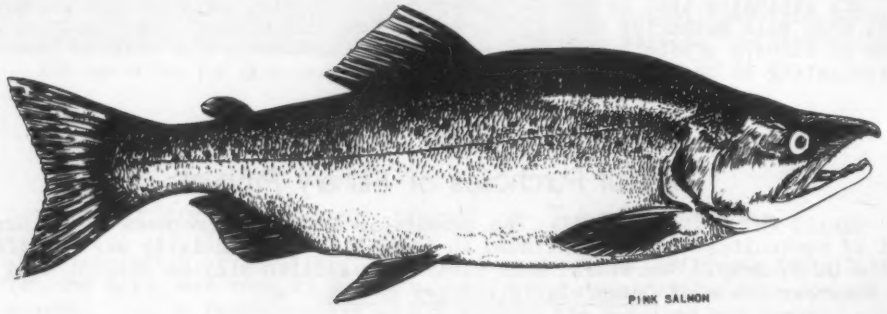
* * *

DEPARTMENT OF THE ARMY, July 1948: Purchases of fresh and frozen fishery products during July 1948 by the Army Quartermaster Corps for the U.S. Army, Navy, Marine Corps, and Air Force for military feeding amounted to 1,513,512 pounds valued at $497,910. The total purchases to date, January through July, totaled 9,438,142 pounds valued at $3,373,330.

## Low Alaska Salmon Runs Cause Fishing Curb

Unusually poor salmon runs in Southeastern Alaska this season prompted the Service to prohibit practically all commercial fishing in that region during the week of August 16-23, explained Albert M. Day, the Service's Director. This was the first time in the history of the Southeastern Alaska salmon industry that fishing activities were curbed in the middle of the scheduled season.

The Service's Director, who returned to Washington on August 25 after a five-week stay in Alaska, declared that an insufficient number of salmon have reached their natural spawning grounds in inland streams.



PINK SALMON

The salmon runs in Southeastern Alaska (the chief pink salmon-producing area in the Territory) have become lower during each of the past six years. To protect them, the Service opened the 1948 season on August 9. The legal season ordinarily opens as early as June. This year's season is scheduled to close on September 3. If a late salmon run develops, however, the season may be extended a few days beyond the deadline to make up for the one week's fishing restriction.

Despite this protective measure, the salmon have appeared in too small numbers to provide either a satisfactory commercial catch or a sufficient seeding in the streams for reproduction of a new and heavy salmon cycle.

By the end of the third week of August, only 80,000 cases of pink salmon had been packed this year. In 1947, at a comparable time, 340,000 cases had been packed.

The production of pink salmon in Southeastern Alaska in the years 1935-39 averaged 2,126,100 cases. An average pack of only 1,795,883 cases was recorded in the next six years. Production dwindled to 991,713 cases in 1946, and to 682,261 cases in 1947. This year's total production will be even lower.

Heavy overfishing during the past decade is blamed for the present crisis in the Southeastern Alaska salmon fishery. In addition, many streams in which the salmon spawn are virtually dry this season because of the exceptionally dry weather.

Alaska's economy will be seriously affected if salmon fishing conditions do not improve. The fisheries are the most valuable of Alaska's resources, providing up to 80 percent of the Territory's income.

## New Pacific Oceanic Fishery Program

The new Pacific Oceanic Fishery Program calls for "investigation, exploration, and development of the high seas fisheries of the Territories and Island Possessions and intervening areas in the tropical and subtropical Pacific Ocean." Tremendous areas will be covered by the investigation, extending from Hawaiian waters through the mandated islands. Authorized under the terms of the Farrington Act, approved August 4, 1947, the 80th Congress appropriated $1,000,000 for this program.

The valuable tunas and the other fishery resources in these waters are the least understood, scientifically, of all important food fishes.

Through research and experimentation, Service investigators will develop and coordinate the basic information upon which a productive American fishing industry can be carried on in the Pacific. The yield of tuna, alone, from potential fisheries in the Central and Southwest Pacific, has been estimated to be worth from $80,000,000 to $100,000,000 a year.

Conversion of three ocean-going vessels into research ships, construction of the Pacific Oceanic Fishery Laboratory on the campus of the University of Hawaii in Honolulu, and development of a docking and warehouse site at Pearl Harbor will be the first problems to be tackled by the new laboratory staff. However, a preliminary reconnaissance of certain areas to be studied and a survey of the data gathered by Japanese fishermen and scientists will be made meanwhile as a basis for planning operations when the vessels are ready to go to sea.

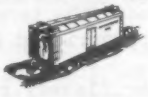
Five technical experts of the Service have been appointed to key staff positions to implement this program. Oscar E. Sette has been selected to head this laboratory as Director, with Fred F. Johnson as Assistant Director. The scientific investigations of the biology of the tunas and other fishes of the Central Pacific will be under the supervision of Milnor B. Schaefer. Carl B. Carlson will be in charge of the exploratory fishing operations. Technological research will be under the supervision of Charles Butler.

## Proposed Changes in Railway Express Charges

A meeting was held in Boston, Mass., on September 14, to discuss proposed Railway Express Agency increases in minimum charges which must be added for ice in shipments of fresh and frozen fish and shellfish. (See Commercial Fisheries Review, July 1948, p. 23.) In attendance were members of the National Fisheries Institute's Traffic Committee, Railway Express Agency officials, and representatives of the Department of Agriculture and the Fish and Wildlife Service.

At the meeting, inequities of the proposal were pointed out by industry officials. Such arguments as "charging more than the traffic will bear" (in the case of low-priced fish, such as carp, mullet, lake herring, buffalofish, etc.) and "diversion of express shipments to trucks" were pointed out.

As a result of the discussions, officials of the Railway Express Agency decided to consider the proposals for another 30 days before determining whether or not to file the ice charges with the Interstate Commerce Commission. Should the Railway Express Agency decide to file the increased charges, there would be a further waiting period of 30 days from the date of the filing during which time a formal protest to the Interstate Commerce Commission requesting suspension of the charges may be filed by shippers. If no protests against the charges are made during that period, they would automatically go into effect.



## Puerto Rican Vessel Fishing Out of Gloucester

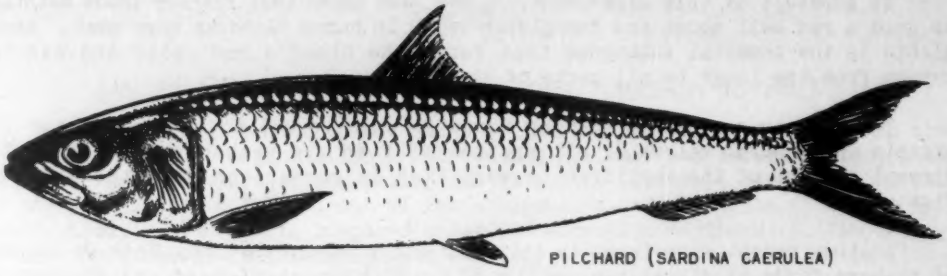
The Reina del Caribe, a 70-foot Puerto Rican dragger-seiner, owned by the Puerto Rican Agricultural Company, has been fishing out of Gloucester for rosefish since early in July. Up to August 19th, 52,149 pounds of frozen fish had been received in San Juan. The fish was frozen in the vessel's refrigerated holds, packaged in wooden boxes and transferred at New York to steamers bound for Puerto Rico. Around 5 percent of the total shipment was made up of haddock, flounder, and cod. The vessel has a freezer capacity of 80 tons.

The Fisheries Division of the Puerto Rican Agricultural Company stated that the fish was to be thawed, scaled, eviscerated, and sold as dressed fish and fillets through wholesale and retail market outlets. The company has already established 14 grocery stores throughout the Island and the same are fairly well equipped with displays and meat freezers. The refrigerated truck recently acquired by this concern is to be used in supplying stocks to these stores. Dressed fish and fillets are selling at 25 and 52 cents retail, respectively.

## Sardine Five-point Voluntary Conservation Program

Effective with the opening of the northern California sardine fishing season August 1, the five-point voluntary conservation program submitted to the California Fish and Game Commission by the Sardine Industry Advisory Committee became a part of sardine reduction permit regulations, according to the July 28th issue of the California State Division of Fish and Game publication, Outdoor California.

At their regular monthly meeting in San Diego, the Commissioners adopted Committee recommendations to establish a five-day sardine fishing week, shorten the fishing season by two months, ban fishing during the five-day full moon period, and requiring a $5,000 performance bond from each of California's 100 sardine reduction plants.



PILCHARD (SARDINA CAERULEA)

The earlier proposal of the Industry Committee setting an eight-inch minimum size limit on sardines and mackerel was adopted by the Commission in June on an emergency basis.

The Advisory Committee stated that the sardine industry recognizes the serious threat posed by the recent shortage of sardines, and that the voluntary proposals for additional regulation are unprecedented in conservation history.

## Tests Prove Fishery Foods as Good as Meat

Tests conducted by a Service pharmacologist and a graduate assistant in fisheries at the Service laboratory in College Park, Md., to show the effect of a diet containing fish on the red cell count and hemoglobin value of human blood have proven that fishery foods are the equal of meat.

The experiment, in cooperation with the University of Maryland's College of Home Economics, was the first of its kind in the College Park Technological Laboratory to use human subjects. The results were announced August 6.

Six University of Maryland co-eds, 19 to 24 years of age, participated in the eleven-week experiment. They consumed a diet of their own choice for three weeks. Blood tests taken once a week during this period reported their red cell counts and hemoglobin values.

During the next seven weeks, four of the girls reduced their meat consumption markedly and consumed fishery foods as the big noon-day dish of their diets. They ate fresh-water fish, salt-water fish, and shellfish--broiled, baked, steamed, and fried. The two other girls continued on their regular diets in which meat was an important item for the duration of the test.

The four girls on the diet of fish returned to their free-choice food fare in the last week of the experiment to provide a second check.

It was noted that the red cell count and hemoglobin value of the four girls on the fish diets remained about the same as when they were eating meat. The

counts and values were the same in relationship as the two girls' on the control diets during the seven-week period. There was even a small increase in the cell count and in the hemoglobin value for the four girls on the fish diets for several weeks.

As a result of this experiment, it has been shown that fishery foods maintain as good a red cell count and hemoglobin value in human blood as does meat. Hemoglobin is the chemical substance that forms the blood's red color and carries oxygen from the lungs to all parts of the body.

The protein content of fishery foods is about equal to that of meat. The protein and mineral values of all species of fish are probably the same. The mineral content of the shellfish is very high in comparison with the flesh of fish.

Another recent experiment in this laboratory showed that from 89 to 96 percent of fishery foods is digestible, while 87 to 90 percent of beef and chicken is digestible.

## To Identify Grooved Shrimp

The pinkish, tan-colored fresh and frozen shrimp now being widely distributed throughout the country are not spoiled common shrimp.

The pinkish, tan-colored shrimp are an infrequently-found species known as "grooved," "brown," or "Brasilian" shrimp. During the past season, they have been caught in unusual quantities in the Gulf of Mexico, particularly by Texas fishermen.

Ordinarily, the grooved shrimp comprise about five percent of the total shrimp catch in this country. Because they have always been cooked and canned, or consumed locally near the point of landing, grooved shrimp in fresh form have never been widely known.

The increased demand for fresh and frozen shrimp over the canned variety and the heavier landings of grooved shrimp in Gulf States fishing centers account for their current overflow on the market.

Because of their pinkish tinge, the grooved shrimp have been mistaken for spoiled common shrimp. In raw form, common shrimp are a greenish-gray. When spoiled, they lose their light color and acquire a bright pinkish tint, not unlike the normal color of raw grooved shrimp.

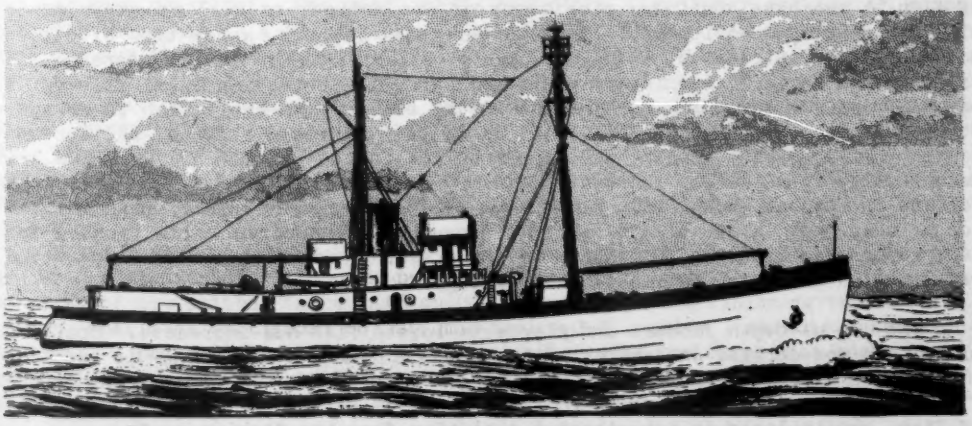
A Service biologist explains that the grooved shrimp can be definitely identified by their translucent, brownish tone, which is darker than the color of common shrimp when spoiled. Besides, spoiled shrimp can be recognized by a foul odor, which grooved shrimp do not have. The taste and food value of grooved shrimp is identical to that of common shrimp. The size and life histories of both species of shrimp, their appearance after cooking, and the amount of cooking time required are also the same. Grooved shrimp keep better for longer periods of time because of their firmer meat.

The grooved shrimp get their name from the grooves on the back of their heads. In marketed form, the heads are removed from all shrimp. The difference in color, which is actually insignificant, is therefore the only difference between the grooved and common shrimp.

## United States Report of Fisheries Situation to FAO

The "Annual Report of the Government of the United States of America to the Food and Agriculture Organization of the United Nations" was issued in June 1948 and is the annual report of the United States to the Director-General of the FAO for the year 1948, in fulfillment of its obligations under Article XI of the FAO constitution. This report, prepared under the direction of the U. S. FAO Interagency Committee, deals primarily with the food and agriculture, including fisheries, situation in continental United States, although certain aspects are equally applicable to the territories and island possessions. Pertinent fishery items follow:

Fish Catch About Prewar in 1947: The catch of fish and shellfish in the United States and Alaska amounted to 2,200,000 short tons in 1947 and contributed an estimated 2.6 billion dollars, or 1.28 percent, to the national income, according to this report. This catch is about the same as the 1935-39 average. Landings of menhaden were over 496,000 short tons--the greatest on record--as compared with 457,450 tons in 1946. About 5,200,000 cases (124,600 tons) of salmon were packed, almost 600,000 cases (14 tons) more than last year, but still below the average for prewar years. The pack of tuna, 5,800,000 cases (56,200 tons) was over one million cases (9,700 tons) larger than in 1946 and a new record. The catch of pilchards was about 125,000 tons--the smallest in over 20 years--due to another failure of the runs off Northern California and appreciably decreased catches off Southern California. The Maine sardine pack totaled 2,800,000 cases (28,400 tons)—only 10 percent under the previous year. Over one million cases (22,000 tons) of mackerel were canned.



1948 REFRIGERATED TUNA CARRIER

Reporting cold storage warehouses froze 123,000 tons of fishery products which was 17,000 tons less than during the previous year. The monthly holdings of frozen fishery products were consistently below the same months in 1946. The manufacture of fish meal amounted to 190,000 tons and the production of fish oil to 57,100 tons.

Imports of groundfish fillets were only 16,800 tons as compared to the record total of 24,600 tons in 1946. However, in 1948 they are expected to equal or exceed the 1946 level. Exports probably will decrease.

Additions of fishing craft to the fleet were about four times the prewar average with 1,300 vessels over 5 net tons being documented. The leading fishing port was San Pedro, Calif. It received some 214,950 tons of pilchards, tuna, and mackerel, primarily for canning purposes. At Lewes, Del., about 125,000 tons of menhaden were landed for reduction to fish meal and fish oil. In third place, Boston received over 100,000 tons of fish and shellfish, almost wholly for the fresh and frozen trade.

Trends in production have been toward the use of refrigerated carriers operating between shore plants and fishing craft on distant banks. Mechanized and more durable gear have been tested, and numerous aids to navigation and to locating fish have been utilized.

Processing trends include new types of packs of canned anchovies, salmon, and tuna. There have been developments in electronic smoking, fish products for baby foods, and pharmaceutical products from salmon waste. The wider distribution of frozen fish products and an increase in the volume and variety of frozen consumer size packaged products have been noticeable.

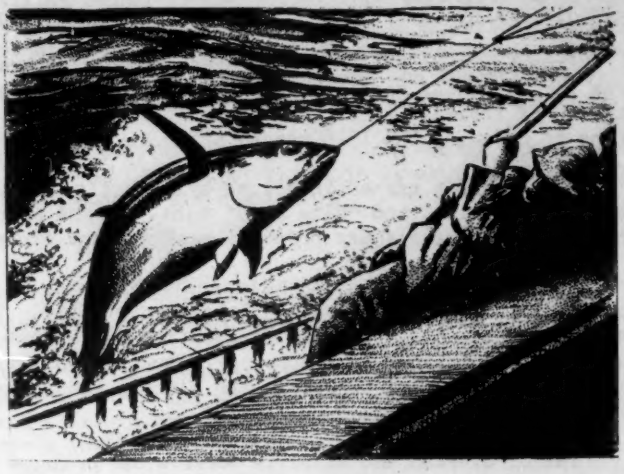
Outlook: The food and agriculture situation in the United States continues favorable. Supplies of most products of agriculture, forests, and fisheries remain high, although they have fallen below wartime peaks. However, the unusually high demand for these products is pressing dangerously on supplies.

Developments in Production and Processing: Attempts to aid the production of fish at sea have continued with tests of new methods as well as experiments with war developed equipment. In the otter-trawl fishery, a new type of otterboard has been introduced; there has been great interest in various means of increasing the vertical opening of the trawl; and, in the shrimp trawl fishery, a bag has been devised which retains the shrimp but permits small fish to escape. Steel has been tried for net and trawl lines, and improved types of suction and conveyor dredges have been placed in operation in the shellfish fisheries. A mechanical pole which may increase fishing capacity considerably is under test for use in the bait-boat fishery for tuna. A 135-foot purse seiner, about a third longer than most large seiners has been launched. The purse seine fishery for tuna is undergoing a great expansion of its fishing area with the development of refrigerated carriers stationed at distant grounds.

The use of depth finders and planes to locate fish has increased. Spotting planes are now carried on several of the larger fishing craft. Radar is becoming more common equipment as a navigation aid, and extensive tests are underway in the field of sonics with the expectation that means will be devised of locating schools of fish, particularly in a horizontal direction from the fishing craft.

Handling of the catch at sea has improved primarily by introducing shore processing methods. Dressing, packaging, and freezing of fishery products on

fishing craft or on factory vessels have increased steadily. Some fishing craft are equipped to produce frozen packaged crab, shrimp, or fillets. There has been a greater development in refrigerated carriers of substantial size which operate on distant fishing grounds. They carry supplies of fuel, food, and equipment for the shorter range fishing craft and freeze their catches. A number are operating in relays on the tuna grounds of Central America thus providing a new fishing area for Pacific Coast purse seiners formerly limited to nearby banks.



FISHING FOR TUNA

Somewhat similar operations are being carried on in Alaska where, also, the 8,500-ton factory ship Pacific Explorer is canning and freezing crabs, filleting groundfish, and producing liver oils, fish meal, and fish oil from the catches of a fleet of fishing vessels in Bering Sea.

Other handling developments include extended use of pumping equipment for unloading the catch, and experimentation with the filleting and freezing in shore plants of fish that were frozen in the round at sea.

Improvements in Distribution: The handling of fishery products during marketing has improved with the trend toward sealed consumer-size packages distributed through freezer cabinets along with other frozen packaged products. Better wrapping materials and cartons have improved products and added to storage life. Lightweight shipping cartons using increased insulation and a minimum of wet or dry ice are more prevalent. One producer is marketing a consumer package in which the fillets remain in a solid block. The block of fish can be cut into serving portions and will remain intact while being cooked and served.

Competition from domestic food products and more particularly from imported fishery products has tended to stress the need for better quality and better handling. Some fishermen are considering a limitation on trip lengths presumably with the thought that shorter trips will produce fewer but better fish with a greater eventual return.

There have been no important developments in inspection systems. The Food and Drug Administration is considering new standards for oysters. The public health services of the United States and Canada have renewed a memorandum agreement relative to shellfish certification. At the National Fisheries Institute Convention in April, a panel discussion on inspection and grading indicated that most phases of the industry were not satisfied with the product reaching the ultimate consumer and several stated that inspection and grading was the apparent solution.

Supplies of fishery products available to consumers appear to have been, on the whole, about the same as during 1946-47. The total catch was about the same,

exports were greater, while imports declined. The tuna pack established a new record, the salmon pack was larger than the previous year but well below prewar years, the California pilchard pack was a failure, the Maine sardine pack held up well, and the canned mackerel pack was the largest in history. There was a considerable volume packed of lesser known and less expensive varieties which may have difficulty in retaining a market when conditions become more normal.

Freezings and holdings of frozen products generally have remained below figures for 12 months earlier. Imports of canned products have been more available. Imports of frozen fillets, particularly in the first quarter of 1948, have shown signs of breaking the 1946 record after a slump in 1947.

New products canned in volume by domestic plants include boned and skinned salmon, anchovies, and "bite size" tuna. There also has been a large increase in the variety of fishery products packaged and frozen in consumer sizes.

Fisheries Education and Research: Opportunities for vocational training and academic education have not increased greatly. The University of Washington in Seattle is taking steps to broaden the curriculum in its School of Fisheries, particularly in fisheries technology. Those few universities which graduate students with training adapted to use in the fishery industries have little difficulty in placing them.

The U. S. Fish and Wildlife Service has produced several films of educational interest, namely, "Retailing Fish," "Filleting and Packaging Fish," and has underway an instructional film on net mending.

The research activities of the Fish and Wildlife Service in the field of commercial fisheries were curtailed considerably during the year. Work at each of the five laboratories was reduced and the use of the four mobile trailer laboratories ceased. Through a cooperative agreement, extensive research was begun, however, on the use of the salmon waste discarded by Alaska canneries.

A new research vessel, Albatross III, was placed in operation in New England waters in March. Biological and oceanographical research will be conducted from the vessel and an improved laboratory at Woods Hole, Mass. Funds have been provided in California by the State and by the industry for the State University to study the diminished pilchard runs with three research vessels. Congress has under consideration at this session a request for an appropriation to conduct extensive fishery studies in Hawaiian waters and in the sub-tropical waters of the Pacific. Preliminary estimates contemplate a laboratory in Honolulu and three ocean-going research vessels—two primarily for exploratory fishing and the third largely for oceanographical and biological research.

Broad fishery studies have been developed in the Philippines under the Service's Philippine Fishery Program. Fishery missions have been at work in Mexico, Guatemala, Venezuela, and Panama. In-service training was provided students from Brazil, Uruguay, Peru, Venezuela, Costa Rica, Bolivia, Argentina, and Philippines.

The Geneva Conference of FAO recommended that FAO should take action to initiate the formation of regional councils for the scientific exploration of the sea. The United States participated in the first meeting called for this purpose at Baguio in February. An agreement was formulated and accepted by the various delegations of Member nations present for submission to their Governments for approval.

The tables in the original report show that the estimated supply and distribution of fish and shellfish in 1949-50 in the United States will total 4,600 million pounds (round weight) per year of which amount 3,285 million pounds are for domestic human consumption and the balance of 1,314 million pounds for industrial use. It is estimated that 4,812 million pounds (round weight) per year will be available in 1949-50 to meet the estimated requirements of which 4,398 million pounds will be produced in the United States and Alaska and 414 million pounds will be imported into this country. The surplus difference between the amount that will be available and the amount that will be consumed will amount to 212 million pounds.

Consumption of fishery products per person per year in the United States during 1935-39 amounted to 11.1 pounds (edible weight), and it is estimated that the 1949-50 consumption will be 12.0 pounds (edible weight).

## Wholesale and Retail Prices

Although the wholesale index for all commodities on August 14 increased 0.1 percent compared with the previous month and 10.7 percent over a year ago, the wholesale index for all foods declined 0.5 percent compared to the previous month, but increased 10.4 percent over a year ago, according to the Bureau of Labor Statistics, U. S. Department of Labor.

The wholesale average price of canned pink salmon at Seattle during August increased 2.7 percent compared with July 1948 and 29.1 percent compared with August 1947. On the other hand, the wholesale average price of canned red salmon declined 7.4 percent compared with the previous month but was 18.2 percent higher than a year ago.

Wholesale and Retail Prices

| Item | Unit | | Percentage change from-- | |
|---|---|---|---|---|
| Wholesale: (1926 = 100) | | August 14,1948 | July 17,1948 | August 16,1947 |
| All commodities | Index No. | 169.0 | +0.1 | +10.7 |
| Foods | do | 190.3 | -0.5 | +10.4 |
| Fish: | | | | |
| Canned salmon, Seattle: | | August 1948 | July 1948 | August 1947 |
| Pink, No. 1, tall | $ per doz. cans | 5.565 | +2.7 | +29.1 |
| Red, No. 1, tall | do | 6.60 | -7.4 | +18.2 |
| Cod, cured, large shore, Gloucester, Mass. | $ per 100 lbs. | 14.60 | +0.7 | + 8.1 |
| Retail: (1935-39 = 100) | | August 15,1948 | July 15,1948 | August 15,1947 |
| All foods | Index No. | 216.6 | -0.1 | +10.2 |
| Fish: | | | | |
| Fresh, frozen, and canned | do | 304.4 | +0.9 | +16.0 |
| Fresh and frozen | do | 254.4 | +0.2 | + 9.7 |
| Canned salmon: Pink | ¢ per lb. can | 54.7 | +2.2 | +29.0 |

The decline in retail food prices from mid-July to mid-August, which interrupted a steady increase amounting to 7.2 percent over the four previous months, was primarily the result of more-than-seasonal declines in prices of fresh fruits and vegetables, offsetting increases in meats, dairy products, eggs, and fish. As of August 15, the fresh, frozen, and canned fish index continued to increase and was 0.9 percent greater than the previous month and 16 percent higher than August 15, 1947. The increase, however, was mainly in canned fish. The average retail price of canned pink salmon also continued to increase and was 2.2 percent higher than the previous month and 29 percent over a year ago.

## Angola (Portuguese West Africa)

CANNED AND DRIED FISH EXPORTS: Angola's fishing industry which is centered in the district of Mocamedes reported exports during 1947 of 1,301 tons of canned fish, such as tuna and similar varieties, according to a report from the American Consulate at Luanda, Angola. Decreased production is attributed to smaller catches and the urgent need of tinplate for the manufacture of containers.

Exports of fishery products to the United States as certified at the Consulate at Luanda during 1947 included 154 tons of canned tuna fish, 15 tons of fish liver oil, and 8 tons of shark liver oil.

Angola's Exports of Principal Fishery Products

| Product | 1947 | | 1946 | | 1928 1/ |
|---|---|---|---|---|---|
| | Metric Tons | Value U.S.$ | Metric Tons | Value U.S.$ | Metric Tons |
| Canned Fish..... | 1,301 | 519,973 | 2,341 | 985,070 | 232 |
| Dried Fish..... | 8,104 | 1,177,562 | 10,174 | 1,177,562 | 10,763 |
| Fish Meal..... | 6,675 | 550,824 | 7,429 | 307,494 | - |
| Fish Guano..... | 56 | 2,261 | - | - | - |
| Totals..... | 16,136 | 2,250,620 | 19,944 | 2,470,126 | 10,995 |

1/ Value not available

In addition to canned fish, Angola, during 1947, was able to export 8,104 tons of dried fish, of which the Belgian Congo was the principal purchaser. The Union of South Africa imported 6,675 tons of fish meal from the colony during 1947.

Among the imports, the only fishery products were canned sardines from Portugal and dried cod from the United States. During 1947, 44 metric tons of canned sardines valued at $47,325 were imported into Angola, compared to 24 metric tons valued at $27,458 in 1946. In addition during 1947, 2,200 pounds of dried fish were imported.

## Brazil

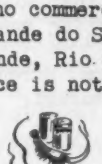
SHRIMP FISHERY: The amount of shrimp available in Brazilian territorial waters and in the high seas off Brazil has never been determined, according to a consular report from Rio de Janeiro. It is known that shrimp are available in varying numbers all along the coast, and the latitude and temperature of these waters would lead to the belief that a shrimping industry comparable to that in

North American sub-tropical waters is possible. Any study of the Brazilian fishing industry should take into account the Brazilian Government's recent action to prohibit the exportation of foodstuffs. Fishery products are not among the items which have been exempted from this prohibition. A firm now being organized is convinced that export licenses for canned shrimp can be obtained.

There exist no statistical data concerning the present extent of Brazilian production of raw or processed shrimp. Raw shrimp are sold in all coastal cities of Brazil, but in recent years, the supply has only occasionally met the demand. The largest shrimping state is Rio Grande do Sul, where shrimp are taken from the large coastal lakes in great numbers.

Present prices now paid to fishermen in the Federal District for shrimp vary from 30 cents to 40 cents per pound for large shrimp and from 10 cents to 15 cents per pound for small shrimp. Prices in Santos are roughly equal to those in the Federal District, and prices in other ports are believed to be somewhat lower.

It is reported that there are no commercial shrimp canneries in Brazil. The shrimp which is shipped from Rio Grande do Sul to other states goes in the dried form. At least one firm in Rio Grande, Rio Grande do Sul, packs dried shrimp in cans, but the extent of this practice is not known.



## Canada

CONSUMPTION OF FISHERY PRODUCTS IN CANADA: Although the war brought about a temporary change in the distribution of fish products in Canada (largely through the setting aside of certain supplies for military and other special purposes and through the cutting off of certain sources of imports) there has not yet, apparently, been a fundamental change in Canadian eating habits with respect to fish. During the past two years, distribution has returned to the prewar pattern, according to the Canadian Fisheries Department periodical, Trade News.

In the calculations that follow, some figures, particularly those for 1947, are preliminary. They should, however, provide a basis for revision of previously published estimates of Canadian fish consumption.

The total "disappearance" of fish food products in Canada, in terms of product weight[1/] was 188.9 million pounds in 1945, the last war year. In 1946, the figure rose to 217.6 million pounds, and slipped back to 209.5 million pounds in 1947. The latter movement probably was related to the increase in meat supplies, but there is evidence that it was connected also with the reduction in the availability of fresh and frozen fillets in that year.

Domestic disappearance accounts for about 30 percent of Canadian production. The proportion varies among different groups of products--about 40 percent for fresh and frozen fish and less than 20 percent for cured (i.e., smoked and salted) fish. The proportion for canned fish has increased from about 10 percent during the war to 30-35 percent at the present time. Imports, negligible during the war, are still of minor importance; only a little more than 5 percent of the total disappearance of canned fish consists of imported varieties.

1/ "Product weight" is the weight in the form in which the fish is marketed.

The present disappearance or consumption of fresh and frozen fish appears to be close to the prewar level. In 1947, however, there was a sizeable decrease in this category amounting to 14 million pounds as compared with the previous year, and eight million pounds less than the 1945 figure. In the case of one important constituent product--fillets of cod--consumption in 1947 was only about 11.5 million pounds as compared with about 20 million pounds in 1945 and 1946. What happened appears to have been this: production was curtailed during the height of the fishing season because of a depressed outlook in the export market, and later the revival of that market resulted in drawing away the limited supply at the expense of the domestic market.

The increasing importance of the canned product is the outstanding development in Canadian fish consumption since the war. Canned salmon has been the chief item contributing to this development, moving from about 200,000 cases in 1945 to 750,000 cases in 1947. It should be noted, however, that the low consumption in 1945 was quite involuntary, being due to wartime restrictions designed to make large quantities available for export, and that a part of the 1947 disappearance went into the replenishing of "pipeline" stocks (i.e., at wholesale and retail levels) that had become exhausted during the period of short supply.

With the exception of a few items, cured or partially-cured fish enjoys only a very small outlet on the Canadian market.

In order to show more clearly the relative importance of different types of fish products in the national dietary pattern, there is presented below a table of per capita consumption in greater detail and on an "edible weight" basis. "Edible weight" here is defined as the filleted weight for fresh, frozen and cured fish; shucked weight for shellfish; and as the product weight for canned fish. For fresh and frozen fish, the edible weight, thus defined, is somewhat over half the product weight, but it is only a little less than the product weight of cured fish.

Table 1 - Canadian Per Capita Consumption of Fish, by Products (Edible Weight)

| Marketed Form | 1947 | 1946 | 1945 |
|---|---|---|---|
| | lbs. | lbs. | lbs. |
| Fresh and Frozen: | 5.5 | 6.8 | 6.5 |
| Sea fish, round or dressed | 3.0 | 3.0 | 3.2 |
| Sea fish, filleted | 1.4 | 2.7 | 2.0 |
| Freshwater fish | 0.8 | 0.8 | 1.0 |
| Shellfish | 0.3 | 0.3 | 0.3 |
| Cured: | 1.3 | 2.0 | 1.7 |
| Smoked | 0.5 | 0.7 | 0.7 |
| Pickled (in brine) | 0.5 | 0.5 | 0.5 |
| Salted and dried | 0.3 | 0.8 | 0.5 |
| Canned: | 4.0 | 3.1 | 1.7 |
| Total Per Capita Consumption | 10.8 | 11.9 | 9.9 |

The fish consumed as fresh or frozen, round or dressed, is made up, in order of importance, of salmon (more than a third of the total), halibut, cod and related species, followed by others of minor importance. Cod accounts for two-thirds or more of the filleted salt-water fish, and whitefish ranks first in the group of fresh-water fish.

Cod fillets is the principal product consumed in the smoked form, and a considerable quantity of kippered herring is also consumed. Canadian consumption of pickled fish is made up almost exclusively of herring, and the salted fish consumed is mainly cod (in the wet-salted and boneless dried forms).

Among canned products in domestic consumption in 1947, salmon accounted for almost three pounds per person and herring and sardines for a little under one pound.

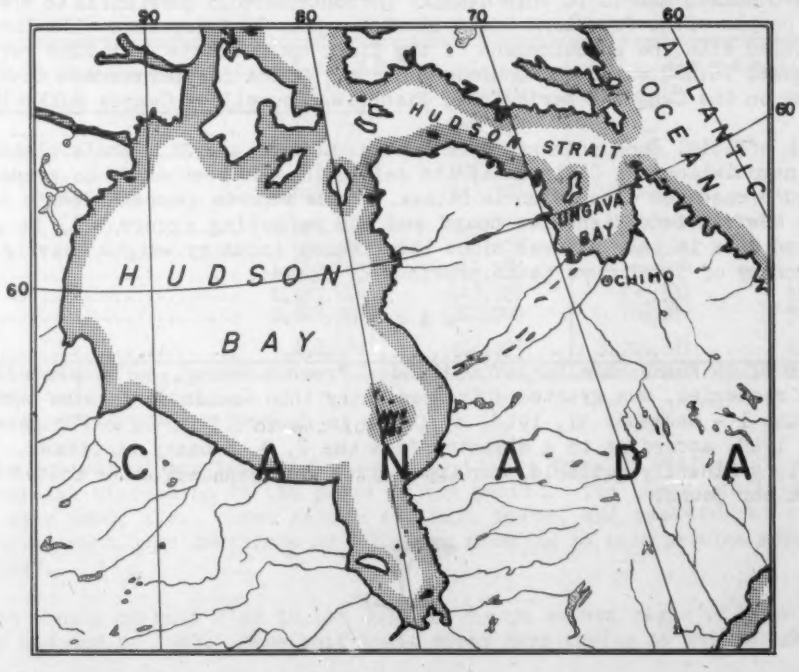
Although the per capita consumption of fish in Canada is now close to prewar levels, it is still low in comparison with the per capita consumption of other animal protein foods, as shown in the following table.

Table 2 - Canadian Per Capita Consumption of Meat, Poultry, Eggs, and Fish

| Protein Food | 1947 | 1946 | 1945 | Pre-war |
|---|---|---|---|---|
| | lbs. | lbs. | lbs. | lbs. |
| Meat (carcass wt., generally) | 144.8 | 145.5 | 141.7 | 117.9 |
| Poultry (dressed wt.) | 21.3 | 21.8 | 25.9 | 18.4 |
| Eggs (shell egg equivalent) | 32.8 | 33.2 | 33.7 | 30.7 |
| Fish (edible wt.) | 10.8 | 11.9 | 9.9 | 11.9 |

Canadian consumption is also low as compared with that of some other countries. In the United Kingdom, for example, the prewar consumption was 26.7 pounds per capita and at present it is about 31.0 pounds. In making comparisons of this kind, however, one must take into account the variation in conditions of distribution and in eating habits among different communities. In Canada, the great distances that separate points of production from the centers of population create a transportation problem unknown in most other countries. The greater number of the people also are conditioned by tradition and experience against the eating of fish. In expanding the domestic market, these are the obstacles that will have to be overcome.

NEW ARCTIC RESEARCH CRAFT: The recently-launched Calanus of the Fisheries Research Board of Canada, after the satisfactory completion of the trial runs off the Nova Scotian coast, will be ready to set out for the eastern Arctic.



Construction and launching of the Calanus represents another stage in the fulfillment of a program of scientific work in the Arctic which has been planned for some time by the Canadian Research Board. The studies are expected to result in biological and oceanographical findings important not only to science, but to the fishing industry as well. Actually, survey work will not get under way except on a limited extent until next spring, since time this year will allow for not much more than the transfer of the vessel from Nova Scotia to the base at Chimo on Ungava Bay. There it will be brought up on shore for the winter to await the arrival next year of the scientific staff.

Included in these investigations will be researches into the shrimp and halibut fishery as well as studies of the oceanography in Hudson Strait, Ungava Bay, and Hudson Bay. Full-fledged investigations get under way next spring.

STUDY OF LAKE WINNIPEG FISHERIES: The Fisheries Research Board of Canada is beginning a study of the fisheries of Lake Winnipeg which will lead to a better understanding of fluctuations in catches and help fish scientists in predictions of abundance of yield. Special attention is being given to "Selkirk whites" which are in high favor wherever whitefish are marketed. Methods of increasing the value of the catch of tullibee or lake herring will also be investigated.

To carry out these investigations, the Research Board has brought to the Lake the research boat Investigator which was used for biological research at Great Slave Lake during the past four summers. The Great Slave Lake investigation resulted in the establishment of a new commercial fishery there which now produces three million pounds of lake trout and whitefish annually.

* * * * *

NEWFOUNDLAND ELECTS TO JOIN CANADA: The controversial question as to whether or not the people of Newfoundland would elect to join Confederation with Canada has been settled with the announcement of the final count of the July 22nd referendum which showed 78,408 votes for Confederation and 71,464 for Responsible Government, according to the Canadian periodical, Fisheries Council of Canada Bulletin.

With official announcements from London, Ottawa, and St. John's clearing the way for negotiations, a Chairman of the delegation has been named to prepare Newfoundland's case for discussion in Ottawa. Press reports from St. John's indicate that the Newfoundland Fisheries Board and its marketing agency will be a chief topic, and this is only natural since the fishing industry weighs heavily in the total economy of the future tenth province of Canada.

* * * * *

NO DUTY ON FRESH HERRING INTO CANADA: Fresh herring, to be processed in Canadian canneries, was granted duty-free entry into Canada during the temporary period June 1 - December 31, 1948, by Order in Council, P. C. 2877, passed on June 26, 1948, according to a dispatch from the U. S. Embassy at Ottawa. Fresh herring is ordinarily dutiable, upon importation into Canada from the United States at ½ cent per pound.

# Costa Rica

ESTABLISHMENT OF DEPARTMENT OF CONSERVATION AND FISHING: The Government of Costa Rica on July 27 decreed the establishment of a special Department of Conservation and Fishing to function as a dependency of the Ministry of Agriculture and Industries, according to a report from the American Embassy at Costa Rica.

The new Department will attend to all matters relative to the conservation, exploitation and control of the fauna existing in the seas adjacent to the continental and insular coasts and rivers of Costa Rica. Besides technical functions, statistics, scientific investigation, etc., to be undertaken by the Department, it will control the strict observance of the conservation laws.

EXTENDS SOVEREIGNTY OVER CONTINENTAL SHELF: The Government of Costa Rica in Decree No. 116, issued during July 1948, extends its sovereignty for 200 miles over the seas adjacent to its coasts and insular possessions. Costa Rica in proclaiming sovereignty and national jurisdiction over the continental and insular undersea platform or shelf adjacent to the continental and insular coasts of the territory of Costa Rica, states this to be modelled upon the Presidential Proclamation of the United States of America in September, 1945; the United States of Mexico in October, 1945; the Argentine Republic in October, 1946; the Republic of Chile in June, 1947; and the Republic of Peru in August, 1947.

PRODUCTION OF IMPORTANT FISHERIES, 1947: Tuna Industry in 1947: Exports of tuna in 1947, both fresh and canned, were almost double the 1946 total. Canned tuna was exported almost exclusively to other Central American and South American countries, while fresh (frozen) tuna was exported exclusively to the United States. The following table, which gives tuna exports since 1937, as compiled from data of the Dirección General de Estadistica, indicates a steady expansion in this industry.

Tuna - Exports from Costa Rica, 1937 - 1947

| Year | Fresh 1/ | | Canned | |
|---|---|---|---|---|
| | lbs. | U.S. $ | lbs. | U.S. $ |
| 1937 2/ | 277,574 | 19,250 | -- | -- |
| 1938 | 7,400,727 | 453,787 | -- | -- |
| 1939 | 7,465,260 | 413,441 | -- | -- |
| 1940 | 4,203,280 | 244,432 | -- | -- |
| 1941 | 1,843,184 | 147,920 | -- | -- |
| 1942 | 2,345,847 | 117,703 | 17,186 | 4,058 |
| 1943 | 991,481 | 73,078 | 45,485 | 20,092 |
| 1944 | 1,900,787 | 413,182 | 22,999 | 9,587 |
| 1945 | 1,432,618 | 112,759 | 498,333 | 185,167 |
| 1946 | 2,818,200 | 202,000 | 706,200 | 311,000 |
| 1947 | 3,858,534 | 404,289 | 3,205,473 | 516,962 |

1/ Includes only tuna cleared through customs; fish caught offshore and carried direct to California not shown.
2/ First year exports were made.

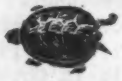
The subject of the tuna fisheries rose to the fore in 1947 as an object of controversial discussion in the press of the nation. The questions involved included gear used, i.e., purse seines vs. bait boats, and taxation by the Costa Rican Government. No decisions or solutions relating to this problem were arrived at in 1947.

The supply of bait fish in the Gulf of Nicoya showed signs of severe depletion by the end of 1947. Many bait boats spent days trying to get enough bait to

make worthwhile a trip out to sea in search of tuna. Whether or not the bait fish will come back--that is, recover in numbers through natural increase--remains to be seen. At present most bait boats make a long trip to Panamanian waters in search of bait.

Shark Fishery: The total tonnage of shark livers exported in 1947 was 219 metric tons, as compared with 105 tons shipped in 1946. However, the total value of the 1947 tonnage was only $53,061, as compared with $79,000 for the 1946 shipments. Towards the end of the year, catches had dropped off greatly and in the opinion of several local fishermen Costa Rican waters have been fairly well fished out as far as sharks are concerned. The shark carcasses continue to be discarded as heretofore.

Turtles: Export shipments totaling 78 metric tons, valued at $3,790, were recorded on this commodity in 1947. In 1946, 127 metric tons were exported, valued at $5,000.



## Ecuador

TUNA PURSE SEINING IN ECUADOREAN WATERS: An Executive Decree No. 1206-A signed July 2, effective from July 6, and published in Registro Oficial No. 240 of Ecuador, revokes the prohibition on the use of nets in tuna fishing in mainland and Galapagos waters and modifies fishing permit fees. According to a dispatch from the U. S. Embassy at Quito, this permits use of purse seiners, the first of which were expected in Ecuador in early August. Decree 1296-A also reduces permit fees for first, second, and third and subsequent trips to U.S. $8.50, $7.50, $6.50, respectively, but leaves the annual consular matriculation fee at U.S. $300. Decree also establishes 60 days as effective period for written permits and 45 days for radio permits for fishing vessels of California registry.

Permitting of net fishing is expected to result in a considerable increase in Ecuador's revenues from foreign fishing vessels and a considerable increase in the number of fishing vessels in Ecuadorean waters.

## Italy

FISHERIES AND MARKETS: Introduction: Despite the fact that Italy has a very long coastline, Mediterranean waters around the country are not prolific in fish, and as a result, Italy has traditionally been an important market for fish products. Prior to 1945 (when sanctions and Mussolini's self-sufficiency campaign destroyed the Canadian market), Italy was an important Canadian outlet, particularly for Canadian dried salted cod (baccala) and canned salmon, according to a report submitted by a former Canadian Commercial Secretary in Rome and published in the Canadian Fisheries Department periodical, Trade News. Since then, Italy has tended to buy more and more of its supplies from Scandinavian sources (Icelandic and Danish salted fish have found a preference; canned salmon has not been marketed for several years). Current shortages of hard currency may help to perpetuate these conditions.

Market, 1947: In the first nine months of 1947, Italy produced 235.2 million pounds of fish, of which 93 million pounds were anchovies, sardines, and mackerel; 117 million pounds were other fish; 18.2 million pounds were shellfish; and 7 million pounds were crustaceans.

However, this domestic production was insufficient to satisfy market requirements. In the first eleven months of 1947, a year which saw only a partial return to normal trade, she was also able to import about 200 million pounds of fish, which included: 42 million pounds of fresh or frozen fish; 98 million pounds of dried salted cod; 15 million pounds of stockfish; 4.2 million pounds of salmon, and other dried, salted, or smoked fish; and 25 million pounds of herring and pilchards, salted, pickled, or in brine. The principal sources of supply were Norway (25 percent), Denmark (20 percent), post-UNRRA relief and commercial shipments from U.S.A. and Canada (14 percent), Iceland (12 percent), and Belgium (7 percent).

Compensation Agreements and Methods of Payment: The interesting point about the list of sources is that, with the exception of the U.S.A. and Canada, whose shipments were mostly of a relief nature, the principal imports were from countries with which Italy has compensation or payment agreements. By these present arrangements, Italy is committed to purchase large amounts of fish products per annum.

Methods of payment may also have considerable influence in determining who trades with whom.

In terms of lire, Canadian and United States fish payable in dollars is noncompetitive, and in any case, the Italian Government would not grant licenses for fish payable in hard currency as long as it is available in sufficient quantities from other sources. To a certain degree, this may be mitigated by the European Recovery Plan, but to the extent that fish is available elsewhere, any European country will tend to use its limited funds under the plan for the purchase of other commodities not obtainable from soft-currency countries.

Prices:

C.I.F. Import Prices

| Item | ¢ per lb. |
|---|---|
| Danish large mackerel | app. 8 |
| Danish cod fillets | " 16 |
| Danish wet salted cod | " 12 |
| Danish dried salted cod | " 18 |
| Norwegian dried salted cod | as low as 17 |
| Norwegian dried salted sey (pollock) | app. 8½ |

Fish Import Rules and Regulations: As was well known to exporters to Italy before the war, there were special regulations with respect to the embossing or lithographing (in a clear, indelible manner) of certain information on the covers of each individual can. These regulations were suspended in respect to UNRRA and post-UNRRA relief shipments, but have always been applicable to commercial shipments.

Furthermore, all fish food products preserved in cans or in other containers imported into Italy, must be accompanied by a sanitary certificate stamped and signed by the government authority of the country of origin. The rules and regulations are fairly complex.

## Netherlands

NEW METHOD FOR PRODUCING VITAMIN D-3: Two young Netherlands chemists, who are working in a laboratory in Eindhoven, have developed a method for producing synthetic Vitamin D-3 at a cost considerably below the present price of cod liver oil, used hitherto by persons in need of that vitamin, according to the Netherlands Trade and Industry of July 15, 1948.

The chemists have developed a substance called "Chosterol" which, when exposed to radiation, sheds Vitamin D-3.

It is reported that production on a large scale will not only supply Holland's requirements, but will also leave a surplus for export.

* * * * *

SIGNS TRADE AGREEMENT WITH U.S.S.R.: Trade agreements have been signed by the Netherlands with the U.S.S.R., according to the August 14th issue of the Canadian periodical, Foreign Trade.

The agreement is for an indefinite period and quantities are to be fixed every twelve months. Under the terms of the U.S.S.R.-Netherlands agreement, initiated in Moscow on June 10, 1948, the U.S.S.R. will supply various important raw materials, while the Netherlands will provide herring and other manufactured products and raw materials.

## Norway

FISH ALBUMEN TO PALESTINE: Norway is exporting 50 tons of albumen concentrate to Palestine, according to a recent Oslo report. This concentrate (synthetic egg white) represents a new Norwegian product and is derived from fish by a Norwegian firm. The same firm is also responsible for the extensive laboratory work leading to the commercial production of this product. Trial exports have earlier been sent to a number of European lands, including Germany, and the product has also had a limited sale in Norway.

* * * * *

TRADE AGREEMENT WITH BIZONIA: The new trade agreement with Bizonia stipulates Norwegian exports of about $34.8 million and German exports of about $16 million, according to the August 24 issue of Norway Digest of the Royal Norwegian Information Services.

Under the agreement, Norway will export fish to a value of $16 million; whale oil, $6.8 million; and wood pulp, $5 million. From Germany, Norway will import coal, machinery, scrap-iron, steel, textiles, and chemicals.

## Republic of the Philippines

CANNED SMOKED OYSTERS: Canned smoked oysters, a new exportable product suitable for production in the Philippines were tested by fisheries experts in a

recent session at the Philippine Fishery Program laboratory in Rizal City, according to an announcement by the U. S. Fish and Wildlife Service Philippine Fishery Program and the Philippine Bureau of Fisheries on July 29. This delicacy is the first of what is hoped to be a series of such products that the two agencies are planning to develop.

The Director of the Philippine Bureau of Fisheries, has indicated that there are several large areas in the Philippines suitable for oyster cultivation. Some of these areas are in partial production at the present, but the possibilities of expansion of the oyster industry, particularly in the estuaries of the north-central provinces of Luzon, are very promising.

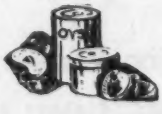
The chief technologist of the Philippine Fishery Program, under whose supervision the experiments on oyster canning were carried out, believes that smoked oysters would make a good specialty item for production in areas where no market for fresh oysters exists, or where transportation to the fresh market is difficult. However, to make a satisfactory product, oysters must be canned when they are fat. The best season is believed to be during the months of May, June, July, and August in central Luzon. Hence, the oyster industry, so far as the actual canning operation is concerned, would be seasonal.

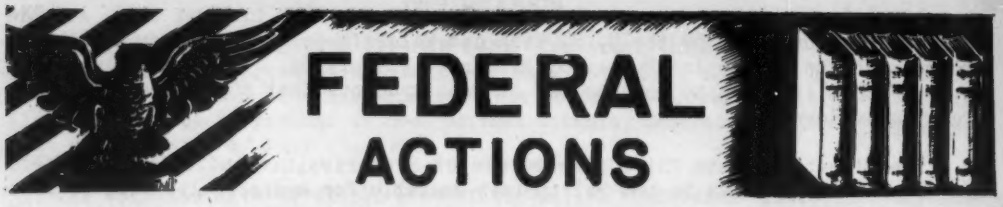
NEW VESSEL ADDED TO FISHERY FLEET: A new demonstration fishing vessel, the David Starr Jordan, was added to the fleet of exploratory vessels now being operated by the Philippine Fishery Program of the Service in early September.

The new vessel, which is a small American all-purpose fishing boat, was shipped from Seattle, Washington, on August 15th. This vessel has been found to be the answer to small fishing operators' problems. It is sea-worthy, has ample power, is economical, efficient and can be devoted to any one of five types of major fishing effort used in the Philippines. It can longline or bait-fish for tuna; drag or otter trawl; or fish seines and gill-nets, as the occasion arises. In the northwestern part of the United States such vessels have proved themselves to be the best proposition for the fisherman with small capital who has to operate throughout the year. They can be worked at all seasons and can be speedily adapted to the segment of the fisheries that are at the time the most profitable.

The vessel is small by many standards, being 54' long with a 13'6" beam and 30 gross tons, with a 135 h.p. Diesel engine with auxiliary generating and pumping equipment; carries a fathometer, direction finder and radio telephone; and will have a crew of five persons in addition to two scientific personnel when needed. It is capable of carrying 40,000 pounds of iced fish.

It is believed that just as American fishermen have found this to be a highly efficient and useful craft, Filipino interests will likewise see the advantages possessed by such an all-purpose vessel. It is one of the answers to the mechanization problem in the Philippine fisheries.






## Department of the Army

EXTENSION OF EASTERN SHORE FISHING LIMITS: Extension of fishing limits off the Eastern Shore of Virginia in Chesapeake Bay, from Onancok Creek to Cape Charles, was announced August 19 by the Secretary of the Army. These limits apply generally to commercial fishermen and regulate the placing of fishing structures, such as traps and pounds.

The extension, which ranges from a few yards up to a maximum of approximately 2,000 yards, will become effective 30 days after details of the new limits appear in the Federal Register. Existing limits generally follow a line of 18-foot depth. A series of straight lines, marked by buoys, will designate the new fishing boundaries.

Extension of the Eastern Shore limits, and a number of other changes in fishing regulations for Chesapeake Bay and its tributaries, were recommended by Lieutenant General R. A. Wheeler, Chief of Engineers, following public hearings and the presentation of views by representatives of Maryland and Virginia and other affected parties.

At the lower end of Chesapeake Bay, the fishing areas are being revised. Two small areas in Lynhaven Roads are being eliminated, and one new area is established there. Another new area is designated in Hampton Roads, at Newport News Middle Ground.

Another change will prohibit fishing structures in a 200-yard fairway in James River. The fairway or open channel is to insure an unobstructed approach to the mouth of the Chickahominy River.

The new ruling also provides that Federal regulations on the marking of leased oyster grounds shall be in accordance with State laws.

Regulations governing the placing and maintenance of fishing structures, such as traps and pounds are issued by the Federal Government solely from the standpoint of protecting the public rights of navigation.

## Reconstruction Finance Corporation

LOANS FOR FISHERY ENTERPRISES: Fishery enterprises organized or operating under the laws of any State (including the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Virgin Islands) of the United States, which are privately owned and conducted for profit, are eligible to apply for loans from the Reconstruction Finance Corporation, according to that agency.

RFC will consider loans to business enterprises for such purposes as the following:

1. To pay labor and purchase material required in the business, including merchandise for resale.
2. To repair vessels, replace machinery, etc.
3. To finance new business or to enable established business enterprises to expand.
4. To finance construction.
5. To pay existing indebtedness.

At the time an applicant first communicates with an RFC Loan Agency in regard to obtaining a loan, he should advise the Loan Agency as to the amount of the loan applied for, how it will be secured, the purpose of the loan, and the nature of his business.

No loan or participation in a loan may be approved by RFC if the financial assistance applied for is otherwise available on reasonable terms. For further information, write Reconstruction Finance Corporation, 811 Vermont Avenue, N. W., Washington, D. C.

## THE CUBAN FISHING INDUSTRY

The economic importance of Cuba's fish industry may best be gauged from its commercial production estimated at roughly 40 million pounds annually before the war, 25 million during the war and 30 million since the end of the war. The wholesale value of this commercial production is estimated at about 2.3 and 3.5 million dollars during the respective periods. No accurate data are available concerning production for all ports of the Island; the above estimates are based on the quantity reported for Habana with estimates for the rest of the Island.

The industry permanently employs some 9,000 men and, in addition, provides work for 7,000 more in allied and subsidiary industries. Although fish is an important item in the Cuban diet, nevertheless the total wholesale value of fish production is considerably less than one percent of Cuba's national income.

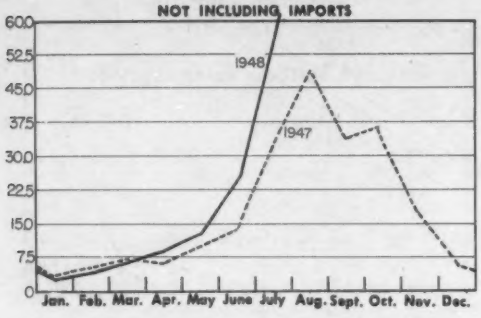
--Fishery Leaflet 308

# LANDINGS AND RECEIPTS

In Millions of Pounds

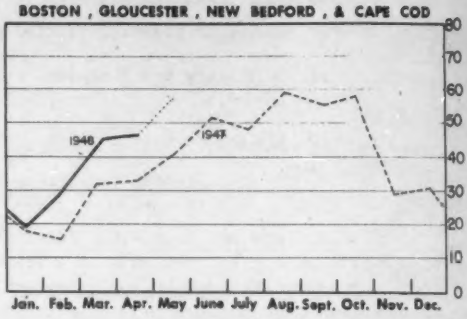
## MAINE - LANDINGS *

NOT INCLUDING IMPORTS



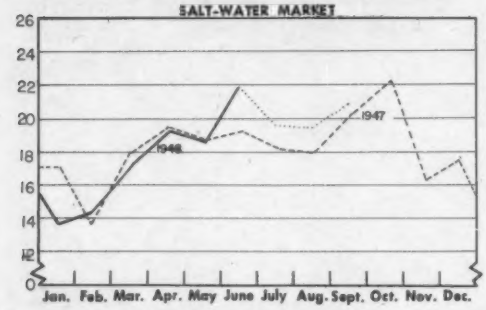

## MASSACHUSETTS - LANDINGS

BOSTON, GLOUCESTER, NEW BEDFORD, & CAPE COD



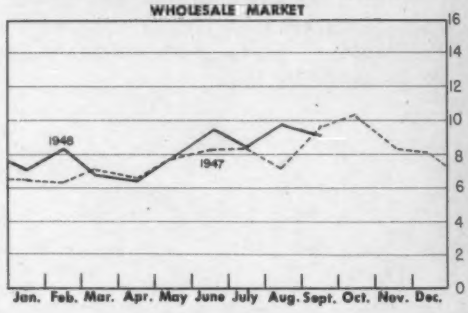

## NEW YORK CITY-RECEIPTS OF FRESH & FROZEN FISH

SALT-WATER MARKET



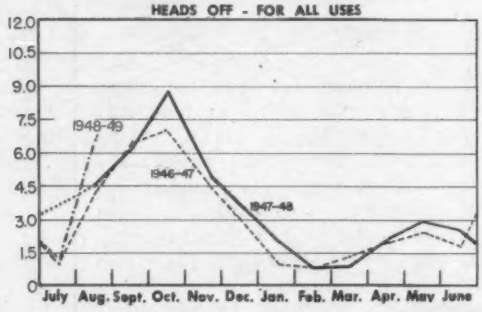

## CHICAGO - RECEIPTS OF FRESH & FROZEN FISH

WHOLESALE MARKET



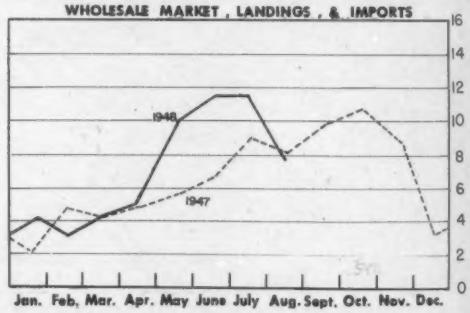

## GULF - SHRIMP LANDINGS

HEADS OFF - FOR ALL USES



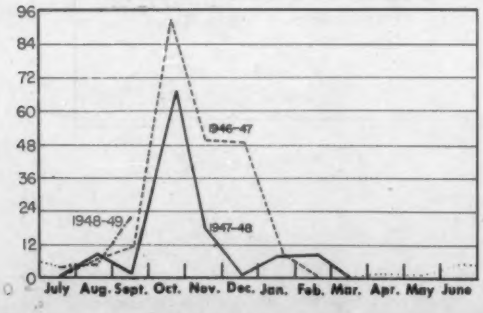

## SEATTLE - RECEIPTS OF FRESH & FROZEN FISH

WHOLESALE MARKET, LANDINGS, & IMPORTS

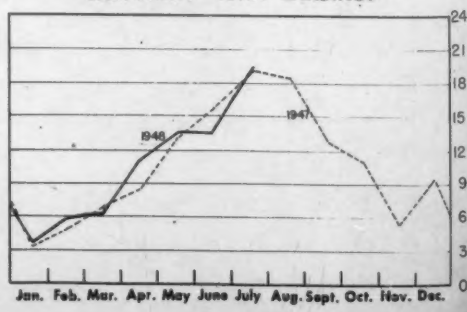



In Thousands of Tons

## CALIFORNIA - PILCHARD LANDINGS




## CALIFORNIA - TUNA LANDINGS

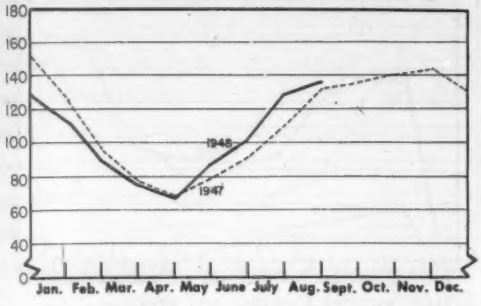



.....ESTIMATED
*REVISED

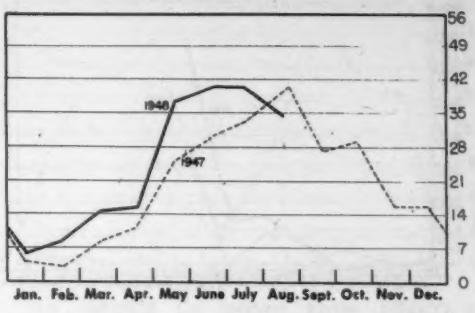
# COLD STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS

In Millions of Pounds

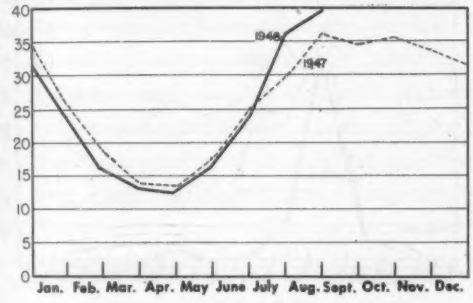
U.S. & ALASKA - HOLDINGS OF FROZEN FISH



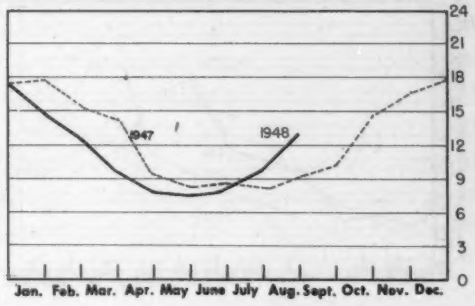

U.S. & ALASKA - FREEZINGS



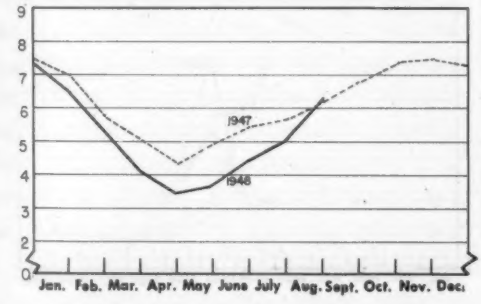

NEW ENGLAND - HOLDINGS OF FROZEN FISH



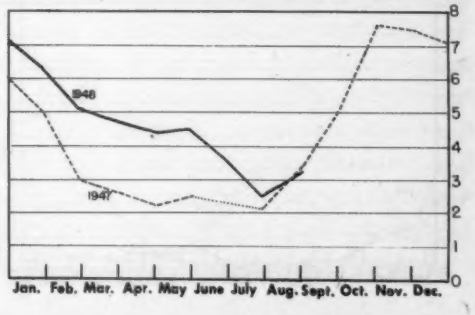

NEW YORK CITY - HOLDINGS OF FROZEN FISH



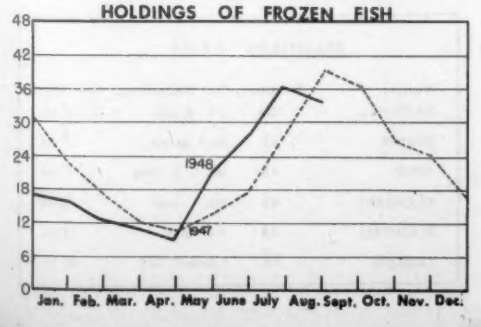

CHICAGO - HOLDINGS OF FROZEN FISH



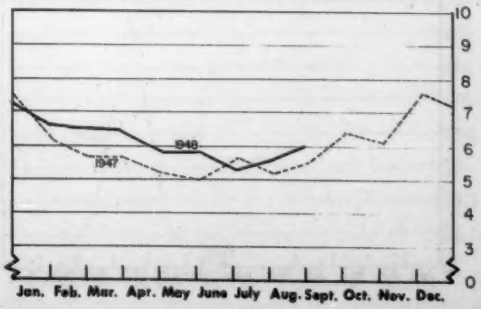

GULF - HOLDINGS OF FROZEN FISH




WASHINGTON, OREGON, AND ALASKA - HOLDINGS OF FROZEN FISH



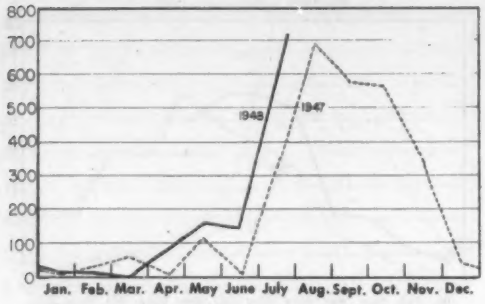

CALIFORNIA - HOLDINGS OF FROZEN FISH



# CANNED FISHERY PRODUCTS

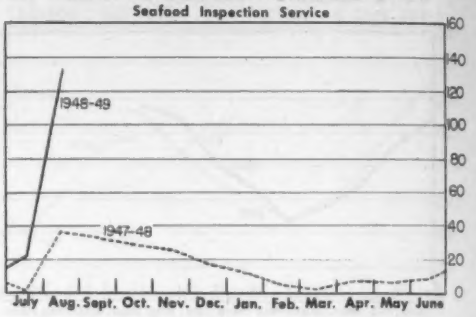
In Thousands of Standard Cases

MAINE - SARDINES, ESTIMATED PACK *

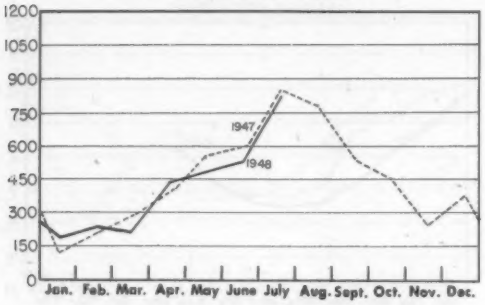



UNITED STATES - SHRIMP

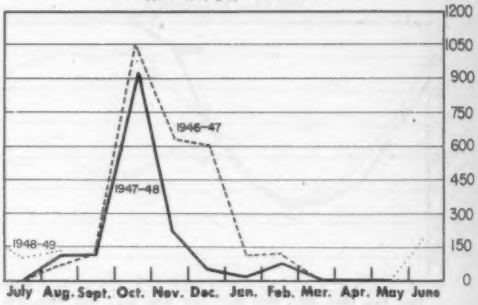
Plants under Food and Drug Administration Seafood Inspection Service



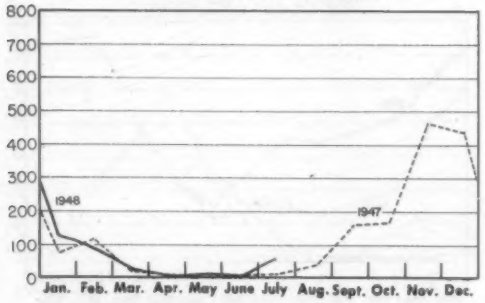

CALIFORNIA - TUNA



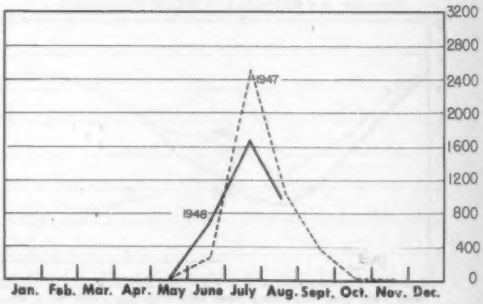

CALIFORNIA - PILCHARDS



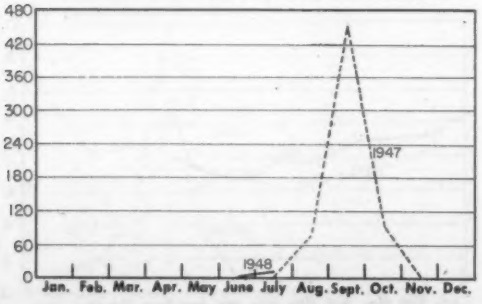

CALIFORNIA - MACKEREL




ALASKA - SALMON




WASHINGTON - PUGET SOUND SALMON *




STANDARD CASES

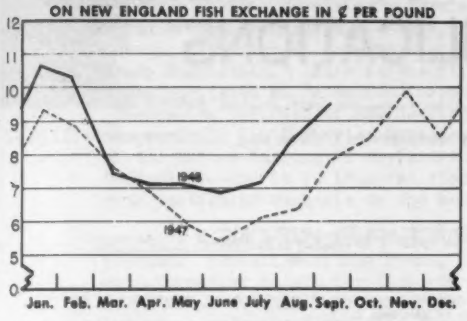
| Variety | No. Cans | Can Designation | Net. Wgt. |
|---|---|---|---|
| SARDINES | 100 | 1/4 drawn | 3 1/4 oz. |
| SHRIMP | 48 | No.1 picnic | 7 oz. |
| TUNA | 48 | No. 1/2 tuna | 7 oz. |
| PILCHARDS | 48 | No. 1 oval | 15 oz. |
| MACKEREL | 48 | No. 300 | 15 oz. |
| SALMON | 48 | 1-pound tall | 16 oz. |

..... ESTIMATED

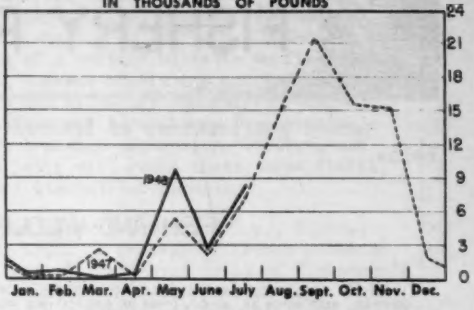
*REVISED

# PRICES, IMPORTS and BY-PRODUCTS

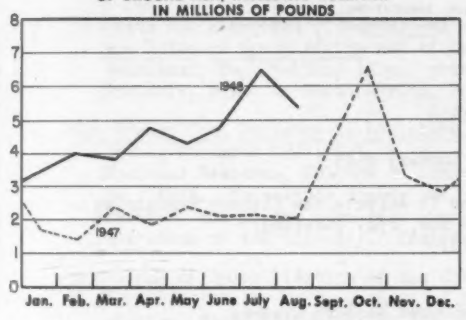
BOSTON - WEIGHTED AVERAGE PRICE
ON NEW ENGLAND FISH EXCHANGE IN ¢ PER POUND



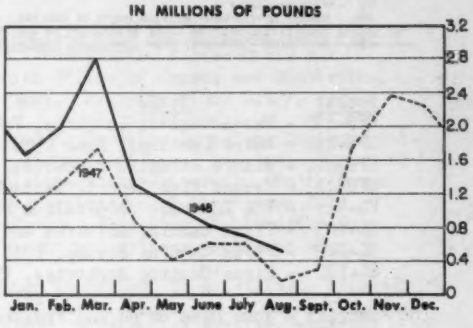

MAINE - IMPORTS OF SEA HERRING
IN THOUSANDS OF POUNDS



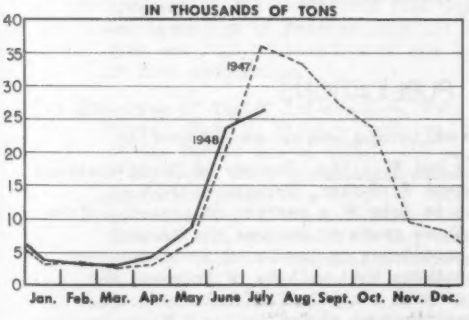

U.S. - IMPORTS OF FRESH & FROZEN FILLETS
OF GROUND FISH, INCLUDING ROSEFISH:-
IN MILLIONS OF POUNDS



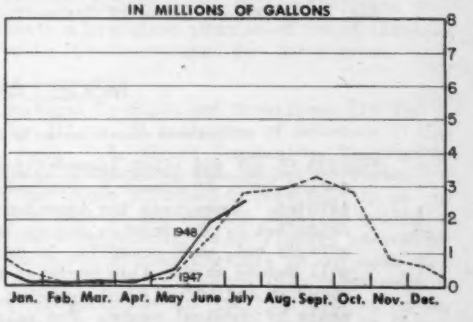

U.S. - IMPORTS OF SHRIMP FROM MEXICO
IN MILLIONS OF POUNDS

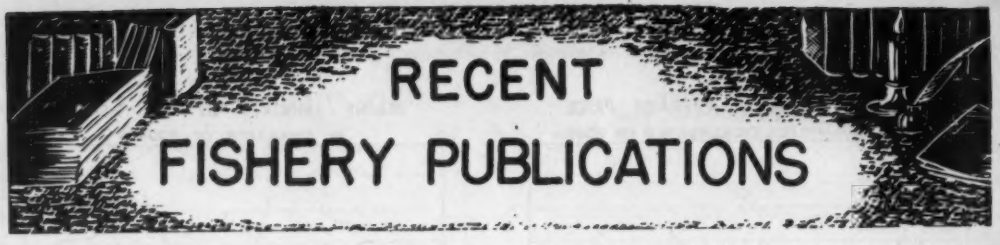



U.S. & ALASKA - PRODUCTION OF FISH MEAL
IN THOUSANDS OF TONS




U.S. & ALASKA - PRODUCTION OF FISH OIL
IN MILLIONS OF GALLONS






Recent publications of interest to the commercial fishing industry are listed below.

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
FL - FISHERY LEAFLETS.
MDL - MARKET DEVELOPMENT SECTION LISTS OF DEALERS, LOCKER PLANTS, ASSOCIATIONS, ETC.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

| Number | Title |
|---|---|
| CFS-420 | - Massachusetts Landings, February 1948 |
| CFS-421 | - Maine Landings, June 1948 |
| CFS-422 | - Middle Atlantic Fisheries, Annual Summary 1945 |
| CFS-423 | - Frozen Fish Report, September 1948 |
| FL-313 | - The Economic Cooperation Program as It Affects the Fishery Industries |
| SL-105 | - Firms Canning Alewives and Alewife Roe, 1947 (Revised) |
| SL-112 | - Firms Canning Shrimp, 1947 (Revised) |
| SL-120 | - Firms Canning Anchovies, 1947 |
| Sep.213 | - Some Data on pH and Freshness of Shucked Eastern Oysters |
| Sep.214 | - Management of the Oyster Resources |
| Sep.215 | - Sanitary Control Practices for the Oyster Industry |
| Sep.216 | - Mechanization of Oyster Cultivation |

## MISCELLANEOUS PUBLICATIONS

THE FOLLOWING PUBLICATIONS MAY BE OBTAINED, IN MOST INSTANCES, FROM THE AGENCIES ISSUING THEM.

Effects of DDT and Other Insecticides on Fish and Wildlife, Summary of Investigations during 1947, by Joseph P. Linduska and Eugene W. Surber, Circular 15, 19 p., printed. Summarizes the important results to date of a variety of investigations conducted by the Service during the past three years to measure the harmful effects and, when possible, to determine procedures or levels of treatment that will reduce them. Also contains recommendations that will be of interest and value to individuals and agencies concerned with control of insects and other pests by chemical means. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., 10 cents per copy.

The Effects on Salmon Populations of the Partial Elimination of Fixed Fishing Gear on the Columbia River in 1935, by D. R. Johnson, W. M. Chapman and R. W. Schoning, Contribution No. 11, 32 p., figures and tables, June 1948, printed. Oregon Fish Commission, Portland, Oregon. Reviews the six major types of commercial gear used to take salmon and steelhead on the Columbia River; the effect of the elimination of fish wheels in Oregon in 1927, and fish wheels, traps, seines and set nets in Washington in 1935; and concludes that measures designed to increase the escapement should apply to all gears and cover the entire life history of each salmon species.

Fisheries Bulletin, August 1948, Vol. 1, No. 1, 24 p., mimeographed. Food and Agricultural Organization of the United Nations, 1201 Connecticut Ave., N.W., Washington 6, D. C., 25 cents per copy. This issue contains a "Summary of Landings in Some Countries"; "Review of Fisheries, 1947", including Canada, South Africa, Venezuela, Iceland, United Kingdom, United States, Newfoundland, Poland, Netherlands, and Denmark; "Current Fisheries, 1948"; and "Comments on Trade Statistics." This is the first issue of a monthly bulletin on fisheries to be published as "a medium for presenting current statistics and for keeping governments informed of new developments in the fisheries industry throughout the world." The Fisheries Division of the Food and Agriculture Organization of the United Nations is divided into three branches--Economics, Biology, and Technology--and it is intended that the Bulletin will cover these three fields, with particular emphasis on the economic and statistical aspects.

Fisherman's Knots and Nets, by Raoul Graumont and Elmer Wenstrom, 203 p., illus., printed. Cornell Maritime Press, New York, 1948. A general reference guide of an informative nature for fishermen. Includes all different types of fishermen's knots known to have been used from the earliest times to the present day. Fishing traps and seines are also dealt with, and net making and repairing are explained and illustrated.

"Forests and Fisheries", Chapters XX and XXI, Reprint from the Official Year Book of the Union of South Africa and of Basutoland, Bechuanaland Protectorate and Swaziland, No. 23-1946, 12 p., printed. Union Office of Census and Statistics, Pretoria, Union of South Africa, Pretoria, 1947. Price 1s. (20¢ U.S.).

The Frozen Food Industry in Louisiana, by William R. Bennett, Louisiana Business Bulletin, December 1947, Vol. 9, No. 2, 56 p., figures and maps, printed. Bureau of Business Research, College of Commerce, Louisiana State University, Baton Rouge, La., 1947. This study traces the historical development of the frozen food industry and at the same time analyzes the factors affecting the location and operation of the industry. Includes data on shrimp, oysters, and crab meat.

A Program of Rehabilitation of the Columbia River Fisheries, 23 p., illus., printed. Prepared jointly by Department of Fisheries, State of Washington; Oregon Fish Commission, State of Oregon; in cooperation with U. S. Fish and Wildlife Service, 1947. Examines the damages done to the commercial and sport fishery resources composed of the anadromous fish stocks of the Columbia River by the construction and operation of Federal dams and also presents a practical program of rehabilitation and full utilization of the lower Columbia River watershed for the purpose of fish production.

Summaries of Tariff Information, Vol. 7, Agricultural Products and Provisions (In Six Parts), Part 2, Fishery Products, (Paragraphs 717 to 721 inclusive of Schedule 7 of the Tariff Act of 1930), 155 p., multilithed. U.S. Tariff Commission, Washington, 1948, free, limited number available. Contains statistical data on United States production, imports, exports, tariff rates, and other information pertinent to an understanding of the conditions of competition between imports and domestic production of fish and shellfish but excluding fishery byproducts. Each fishery commodity summary included contains a table showing the rates of duty provided in the acts of 1922 and 1930, the rate or rates in effect on January 1, 1945--the 1945 rates were in effect in 1947 at the time of the Geneva negotiations--and the 1948 rate or rates. In addition, separates giving the same information for a particular species or fishery commodity as contained in this booklet are available free.

**Processing -- Miscellaneous Service Division**

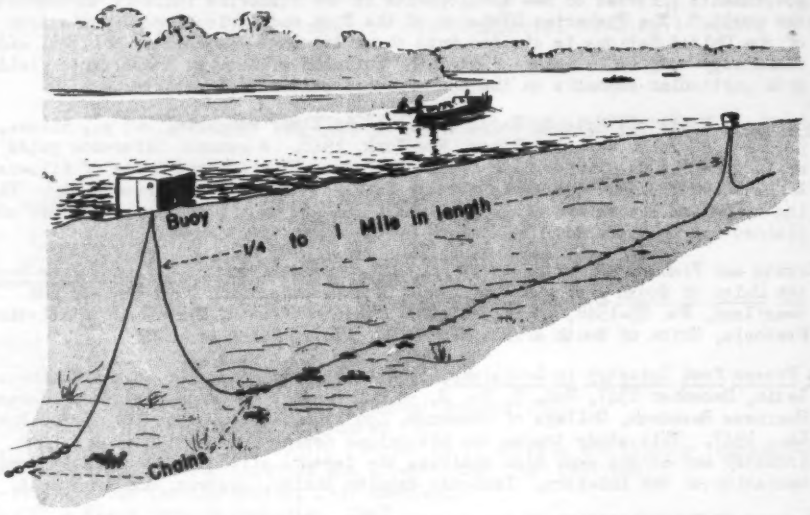
**Illustrator -- Gustaf T. Sundstrom** **Compositors -- Margaret C. Harris and Norma D. Loeffel**

45946

## TROTLINE CONSTRUCTION, OPERATION, AND MAINTENANCE

(CHESAPEAKE BAY TYPE)

Fishery Leaflet 291, "Trotline Construction, Operation, and Maintenance (Chesapeake Bay Type)," recently issued by the Service, describes and illustrates the construction and design of the gear, methods of setting and fishing trotlines, recommended baits and bait attachments, automatic dip-nets, and proper care of lines during storage periods.




This 5-page report has been issued as an aid to fishermen who may be interested in adapting some of the developments that have been made in the type of trotline most generally used throughout the Chesapeake Bay area.

The above mentioned Fishery Leaflet can be obtained free upon request from the U. S. Fish and Wildlife Service, Washington 25, D. C.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PARTMENT OF THE INTERIOR
FISH AND WILD LIFE SERVICE
WASHINGTON 25, D. C.

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